GPS AutoSteer System
Installation Manual

Supported Vehicles

Non-AccuGuide Ready and Non-IntelliSteer Ready

Case STX Wheeled or Quadtrac	Case STEIGER Wheeled or Quadtrac	New Holland TJ	New Holland T
380	380	380	9030
430	385	430	9040
480	430	480	9050
530	435	530	9060
	480		
	485		
	530		
	535		

PN: 602-0244-01-A

LEGAL DISCLAIMER

Note: Read and follow ALL instructions in this manual carefully before installing or operating the AutoSteer system.

Note: Take careful note of the safety information in the Safety Information section and throughout this manual.

The manufacturer disclaims any liability for damage or injury that results from failure to follow the instructions and warnings set forth herein.

Please take special note of the following warnings:

1. There is NO obstacle avoidance system included in the manufacturer’s product. Therefore, users must always have an operator on the equipment when the AutoSteer system is in use to look for any obstacles including people, animals, trees, ditches, buildings, etc.
2. During installation of the AutoSteer system and during the Calibration and Tuning processes the vehicle's wheels turn from side to side and the vehicle moves. Be sure that all people and obstacles are clear of the vehicle before installation, calibration and tuning, or use of the AutoSteer system.
3. Use of the AutoSteer system is NOT permitted while the vehicle is on public roads or in public areas. Ensure that the system is OFF before driving on roads or in public areas.

Special Requirements

Tools

This list consists of special tools required to complete the installation. A complete set of common installation tools is assumed.

Allen Hex Key 1/8”	1/2” open wrench	13mm open wrench
Allen Key 12mm	9/16” open wrench	24mm open wrench
#2 Phillips screwdriver	5/8” open wrench	32mm open wrench
7/16” drill (11mm)	11/16” open wrench	24mm socket wrench
Portable Drill	3/4” open wrench	Oil catch pan
Hacksaw with steel cutting blade	13/16” open wrench	Cleaning rags
Ten Foot Ladder (3.5m)	7/8” open wrench	Wire cutter small
Teflon tape	15/16” open wrench	Cleaning brush
Fiberglass Cable Puller	1-1/8” open wrench	Tape measure (12ft minimum)

Safety Information

Warning Alerts

The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:

- As the operator of the vehicle, you are responsible for its safe operation.
- The steering system is *not* designed to replace the vehicle's operator.

Note: Verify all screws, bolts, nuts, hose connections, and cable connections are tight after the final installation of the AutoSteer system.

⚠ WARNING

To avoid electrical shock hazards, remove the Roof Module from the vehicle before driving under low structures or low electrical power lines.

⚠ WARNING

To prevent injury from falling, ensure you are in a stable position on the vehicle when installing or removing the Roof Rail and Roof Module. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle roof while installing or removing the Roof Rail and Roof Module.

⚠ WARNING

To prevent the vehicle from running over a person, you must never leave the vehicle while the vehicle's operator chair with the AutoSteer engaged.

⚠ WARNING

High-Pressure Fluid Hazard

Read this manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.

⚠ WARNING

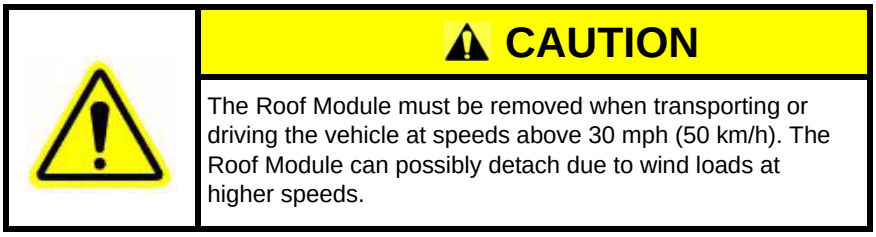
To understand the potential hazards associated with the operation of AutoSteer equipment read the provided documentation before installing the AutoSteer system on a vehicle.

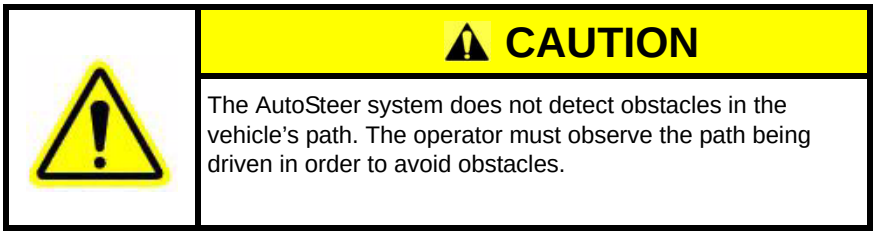
⚠ WARNING

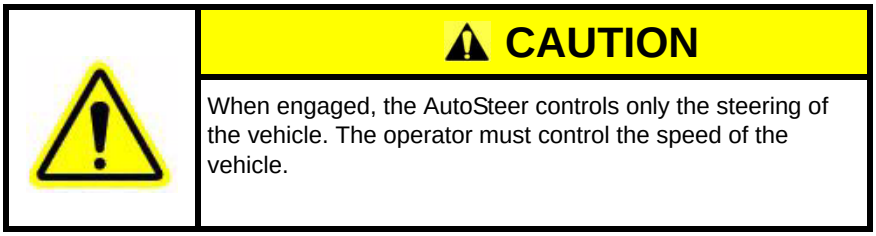
To prevent the accidental engagement of the AutoSteer system and loss of vehicle control while driving on roads, shut down the AutoSteer system (exit the program). Never drive on roads or in public areas with the AutoSteer system turned on.

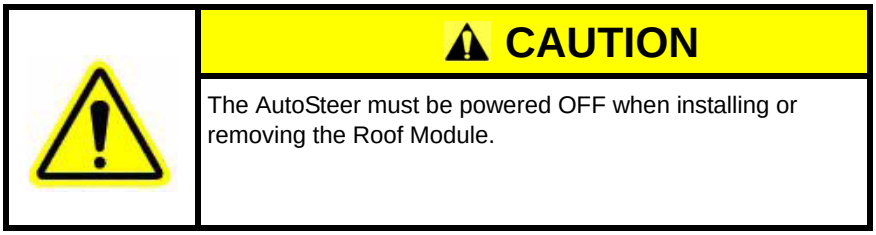
Caution Alerts

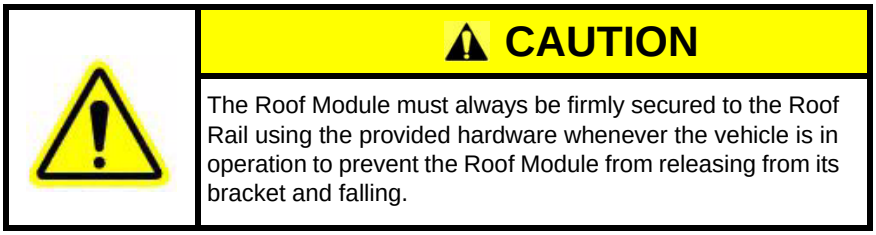
The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:


CAUTION
The Roof Module must be removed when transporting or driving the vehicle at speeds above 30 mph (50 km/h). The Roof Module can possibly detach due to wind loads at higher speeds.


CAUTION
The AutoSteer system does not detect obstacles in the vehicle's path. The operator must observe the path being driven in order to avoid obstacles.


CAUTION
When engaged, the AutoSteer controls only the steering of the vehicle. The operator must control the speed of the vehicle.




CAUTION
The Roof Module must always be firmly secured to the Roof Rail using the provided hardware whenever the vehicle is in operation to prevent the Roof Module from releasing from its bracket and falling.

Vehicle Requirements

This kit is for installing the AutoSteer system on STX/TJ series tractors built in 2006 or later and not AccuGuide-ready. If your tractor is AccuGuide-Ready, contact your dealer for the correct installation kit.

The tractor must be equipped with a fully functional Power Beyond system, including a Pressure Port and a Load Sense on the back of the vehicle.

The vehicle steering and hydraulic systems must be in good working order before installing the AutoSteer system. Check for loose or warn parts. Drive the vehicle and confirm that is steers straight and that the wheels can be turned from full left to full right before installing the AutoSteer system. Check for oil leaks in the steering system and hydraulic hoses.

The vehicle’s electrical system and battery must be in good working order.

The vehicle should be fully cleaned before installing the AutoSteer system. A clean tractor will facilitate the installation, cable routing and hose routing, and will also reduce the chance for oil contamination when the hoses are opened. Clean all the attachment points described in this manual.

Important Information

Note: Verify that all screws, bolts, nuts, hose connections, and cable connections are tight after the final installation of the AutoSteer system.

Technical Support

Refer to your Display user manual for technical support information.

Contact Information

Refer to your Display user manual for contact information.

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Installation Overview

This **Installation Overview** chapter contains information in the following sections:

- *Vehicle Inspection*
- *Kit Overview*
  - *Assemblies*
    - *Common Kit Components*
    - *Hose Kit Components*
    - *Bracket Kit Components*
- *Installation Procedure Outline*
- *Cable Diagram*

This installation guide describes the AutoSteer system installation on several models of Case STX and Steiger wheeled and QuadTrac, New Holland TJ and New Holland T Wheeled. The AutoSteer installation kit PN: 188-0045-01, which contains the components shown in *Figure 1-1* and detailed in *Table 1-1*, is used on these vehicle series. The *Assemblies* section of this manual contains the sub-assembly identification information.

Vehicle Inspection

Before you install this AutoSteer system, confirm the vehicle steering system is in good working order. Drive the vehicle and verify the vehicle's correct working order. Also, ensure the following system operations and components:

- Verify you can turn the vehicle.
- Ensure the vehicle steers straight.
- Check for loose or worn steering components.
- Check for hydraulic fluid leaks throughout the system.
- Ensure the hydraulic fluid level is correct.
- Service the vehicle if the steering is not in good working order.

Kit Overview

Figure 1-1 Case and New Holland Kit Components (PN: 188-0045-01)

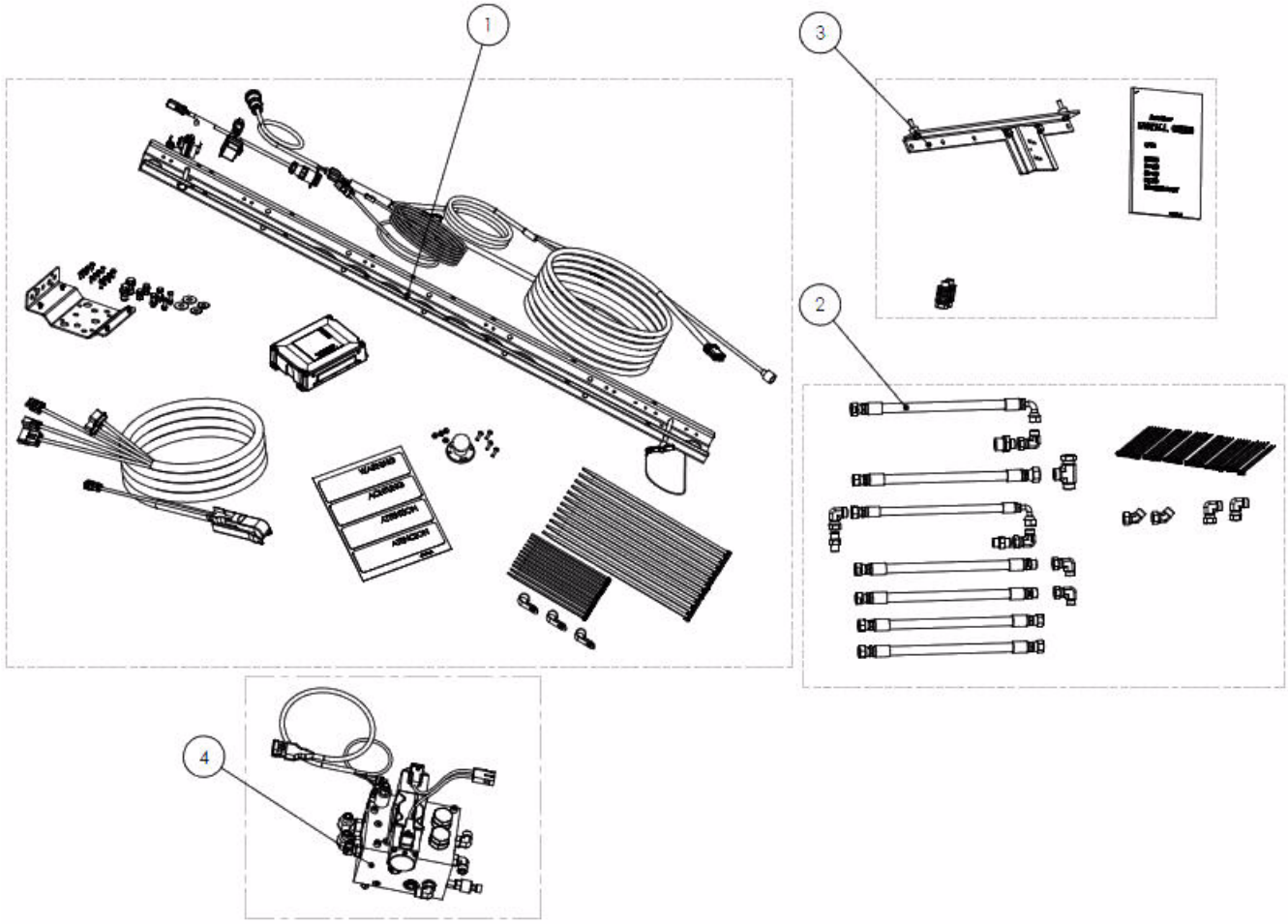


Table 1-1 Case and New Holland Kit Components (PN: 188-0045-01)

Item	Component	Part Number
1.	Common Kit	153-0009-01
2.	Hydraulic Hose Kit	500-0368-02
3.	Bracket Kit	152-0052-01
4.	High Flow Valve	500-0016-04

Assemblies

The Case and New Holland vehicle installation kit contains the following components:

- *Common Kit Components*

- *Hose Kit Components*
- *Bracket Kit Components*

Common Kit Components

Figure 1-2 Common Kit Components (PN: 153-0009-01)

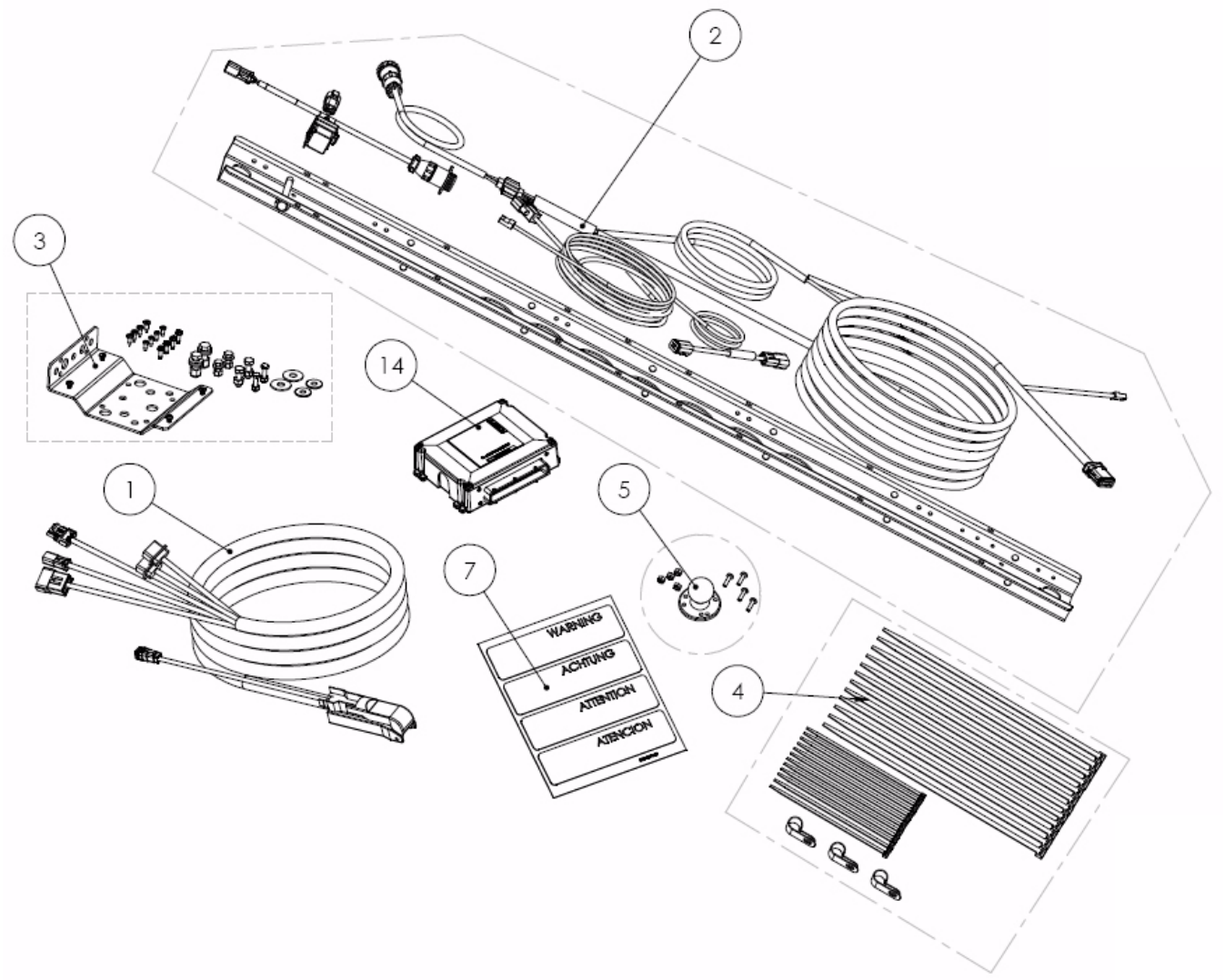


Table 1-2 Common Sub-Assembly Components (PN: 153-0009-01))

Item	Component	Part Number
1.	SA Module Harness	201-0371-02
2.	Common Installation Kit	200-0497-02
3.	SA Module Bracket	200-0190-01

Item	Component	Part Number
4.	Mounting Hardware	200-0076-01
5.	Display Mounting Base Assembly	200-0508-01
7.	Warning Labels	603-0074-01
14.	SA Module Assembly	200-0206-01

Hose Kit Components

Figure 1-3 Hose Kit Components (PN: 500-0368-02)

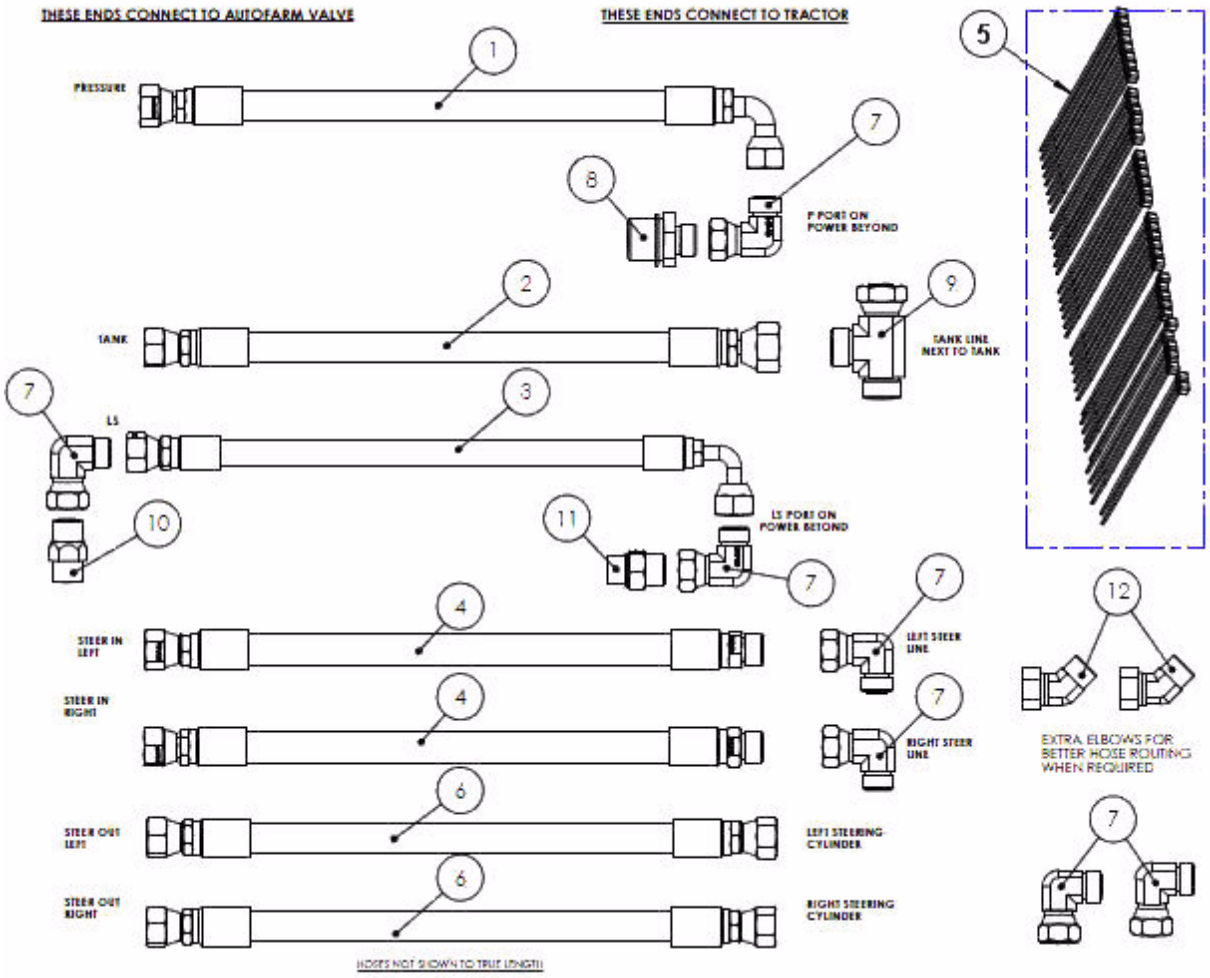


Table 1-3 Hydraulic Kit Components (PN: 500-0368-02)

Item	Component	Part Number
1.	Hose Assembly 1/2” x 174”, -8F x -8F 90 DEG. ORFS	F451TC-JCJ9080808-174
2.	Hose Assembly 1/2” x 96”, -8F x -10F ORFS	F451TC-JCJC081008-96

Item	Component	Part Number
3.	Hose Assembly 3/8” x 174”, -8F ORFS x -8F 90 DEG. ORFS	F451TC-JCJ9080806-174
4.	Hose Assembly 1/2” x 42”, -8F x -8M ORFS	F451TC-JCJ0080808-42
5.	Cable Ties[a]	200-0467-01
6.	Hose Assembly 1/2” x 42”, -8F x -8F ORFS	F451TC-JCJC080808-42
7.	Nut Elbow Adapter	8 C6LO
8.	Straight Adapter	8M27F87OMLO
9.	Run Tee Adapter	10 R6LO-S
10.	Check Valve	DT-500-MOMS-5
11.	Adapter M18 ORB x -8M ORFS	8M18F870MLO
12.	Adapter 45 Deg. Elbow -8 ORFS	8 V6LO-S

a. The colored cable ties included in the kit are used to identify the hydraulic hoses. Place identical colored cable ties at the ends of each hydraulic hose to positively identify the hose.

The suggested hose color assignments are as follows:
Pressure - Red
Tank - Green
LS - Grey
Steer Out Right- Yellow
Steer Out Left- Orange
Steer In Right - Yellow and Blue
Steer In Left - Orange and Blue

Bracket Kit Components

Figure 1-4 Bracket Kit Components (PN: 152-0052-01)

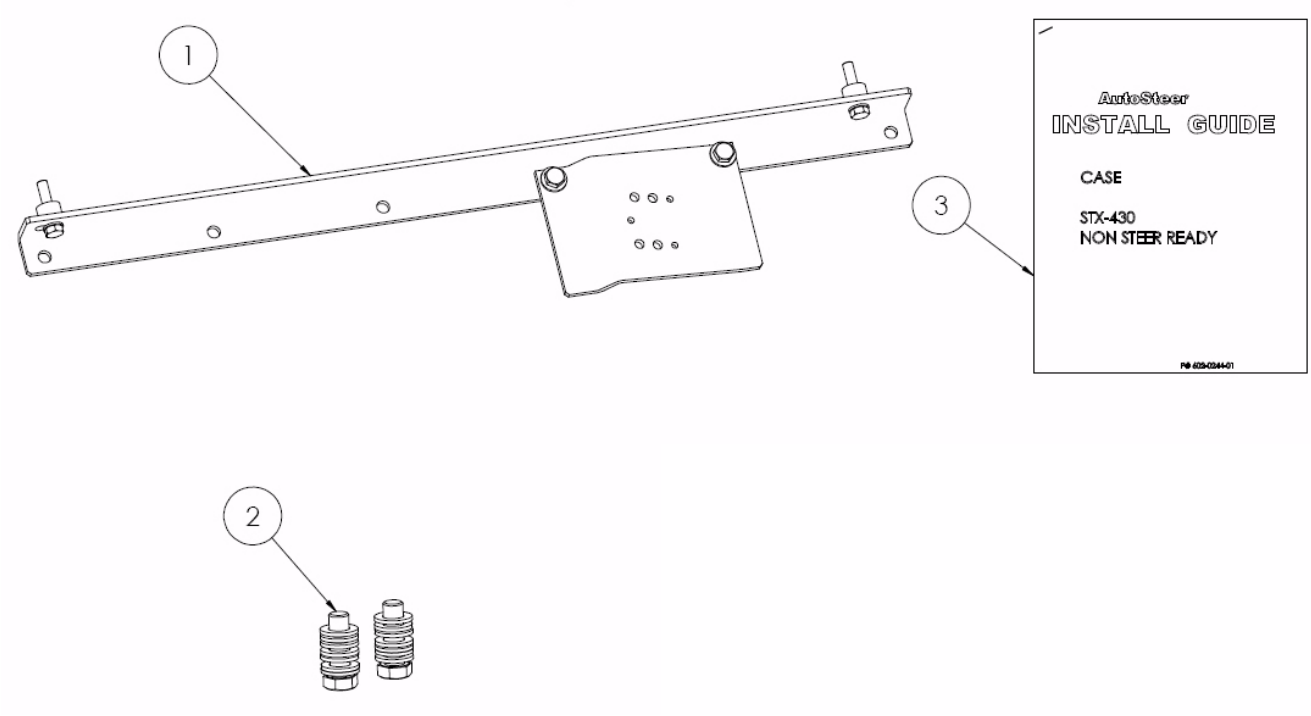


Table 1-4 Bracket Kit Components (PN: 152-0052-01)

Item	Component	Part Number
1.	Display Bracket Assembly	200-0256-02
2.	Bolt Kit	200-0451-01
3.	Installation Guide	602-0244-01

Installation Procedure Outline

Note: The system interconnect cable diagram in the *Cable Diagram* on page 8 section of this chapter shows the AutoSteer electrical connections.

1. Verify shipped components.

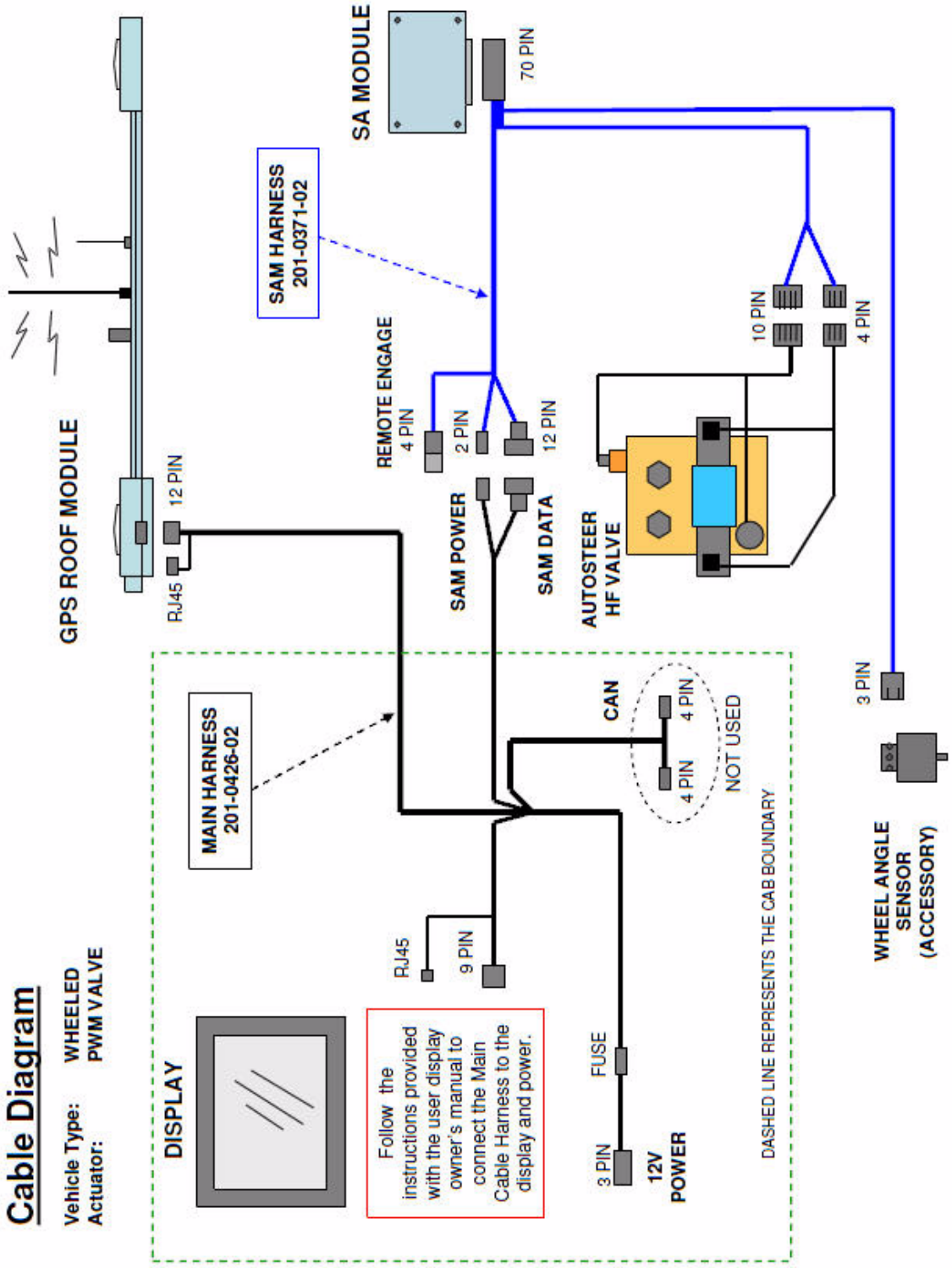
Note: *Step 2*, *Step 3*, *Step 4*, *Step 5*, *Step 8*, *Step 9*, and *Step 14* are skipped if installing an electric steering actuator.

2. Install the Hydraulic Steering Valve Assembly.
3. Install the Hydraulic Hoses.
4. Install the Wheel Angle Sensor. (Optional)
5. Install the SA Module.
6. Install the Roof Rail on the cab roof.
7. Install the Roof Module on the Roof Rail.
8. Install the SA Module Harness and route cables to the various sensors.
9. Route SA Module Harness towards the cab.
10. Install the Display Bracket and the RAM Mount Ball inside the cab.
11. Install the Display using a RAM Mount.
12. Install the Main Cable Harness and route cables to Roof Module and power connector.

Note: Instructions for connecting the vehicle kit cables to the Display can be found in the Display user manual.

13. Connect the Main Cable Harness to the Display Harness.
14. Connect the Main Cable Harness to the SA Module Harness.
15. Verify all connectors are properly coupled and secured.
16. Power ON the system.
17. Calibrate the vehicle.
18. Tune the vehicle.
19. Verify the system has been installed properly and operates satisfactorily.

Cable Diagram



Steering Valve Installation

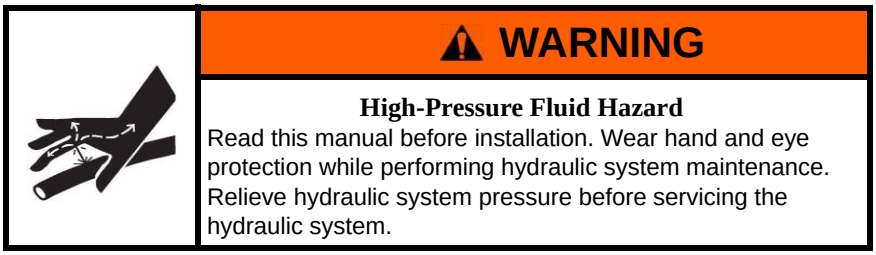
This **Steering Valve Installation** chapter information is provided in the following sections:

- *Steering Valve Installation Procedure Overview*
- *Hose Kit*
- *Check Valve Configuration*
- *Install the Steering Valve Bracket*
- *Hydraulic Hose Connection Procedures*
  - *Pressure Hose Connection*
  - *Tank Hose Connection*
  - *Load Sense Hose Connection*
  - *Steering Valve Right and Left Steering Hose Connections*
- *Pressure Transducer Installation*
- *Steering Valve Installation Checklist*

Steering Valve Installation Procedure Overview

Note: You can use a fiberglass cable puller to make it easier to pull the hydraulic hoses and electrical cables through and around the vehicle.

1. Configure the Check Valve.
2. Install the Steering Valve on the vehicle.
3. Connect the seven hoses between the Steering Valve and the vehicle.
4. Check for oil leaks.
5. Perform a functional test to confirm correct Steering Valve operation.


WARNING
High-Pressure Fluid Hazard
Read this manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.

Hose Kit

Figure 2-1 Hose Kit Components (PN: 500-0368-02)

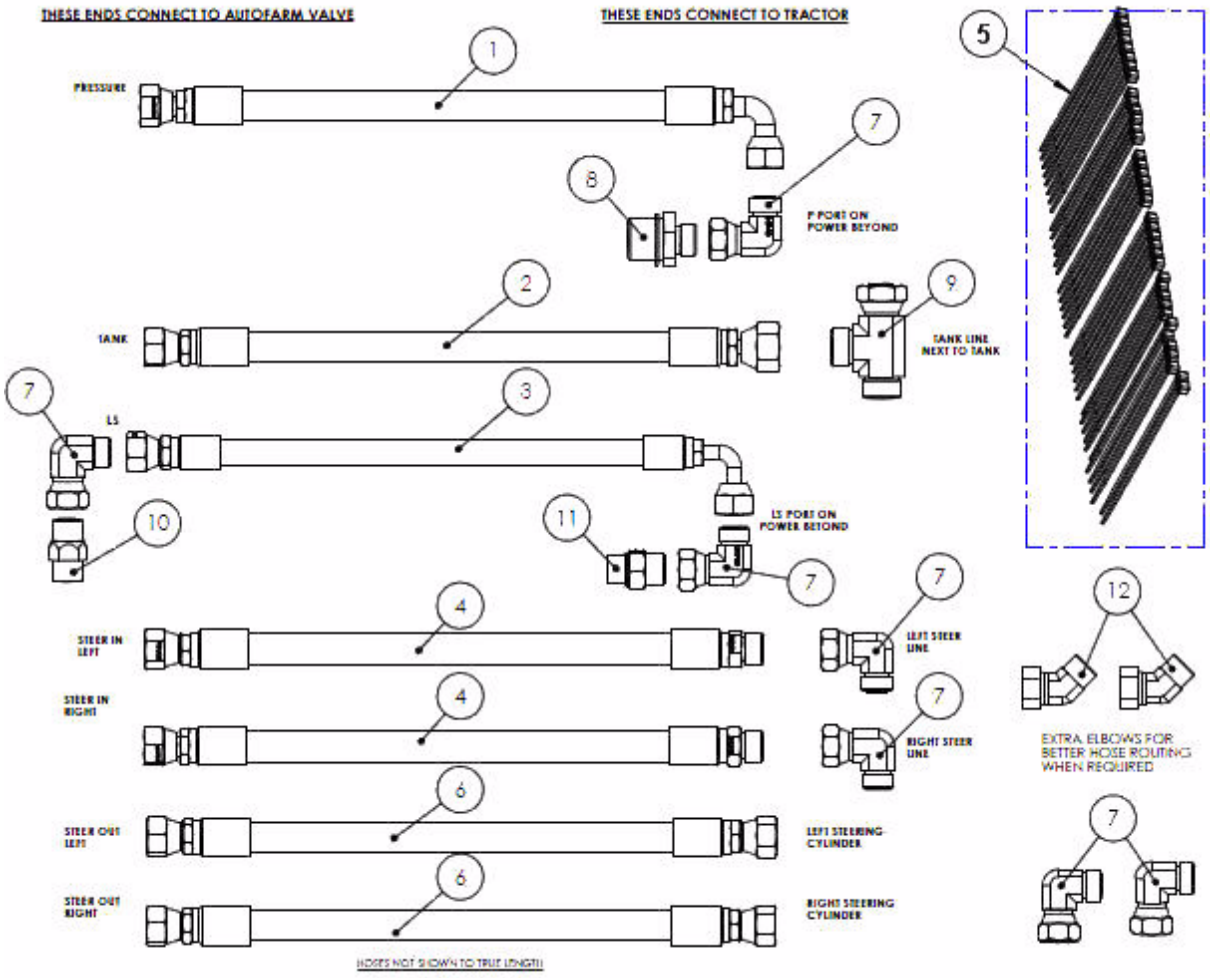


Table 2-1 Hydraulic Kit Components (PN: 500-0368-02)

Item	Component	Part Number
1.	Hose Assembly 1/2” x 174”, -8F x -8F 90 DEG. ORFS	F451TC-JCJ9080808-174
2.	Hose Assembly 1/2” x 96”, -8F x -10F ORFS	F451TC-JCJC081008-96
3.	Hose Assembly 3/8” x 174”, -8F ORFS x -8F 90 DEG. ORFS	F451TC-JCJ9080806-174
4.	Hose Assembly 1/2” x 42”, -8F x -8M ORFS	F451TC-JCJ0080808-42
5.	Cable Ties[a]	200-0467-01
6.	Hose Assembly 1/2” x 42”, -8F x -8F ORFS	F451TC-JCJC080808-42
7.	Nut Elbow Adapter	8 C6LO

Item	Component	Part Number
8.	Straight Adapter	8M27F87OMLO
9.	Run Tee Adapter	10 R6LO-S
10.	Check Valve	DT-500-MOMS-5
11.	Adapter M18 ORB x -8M ORFS	8M18F870MLO
12.	Adapter 45 Deg. Elbow -8 ORFS	8 V6LO-S

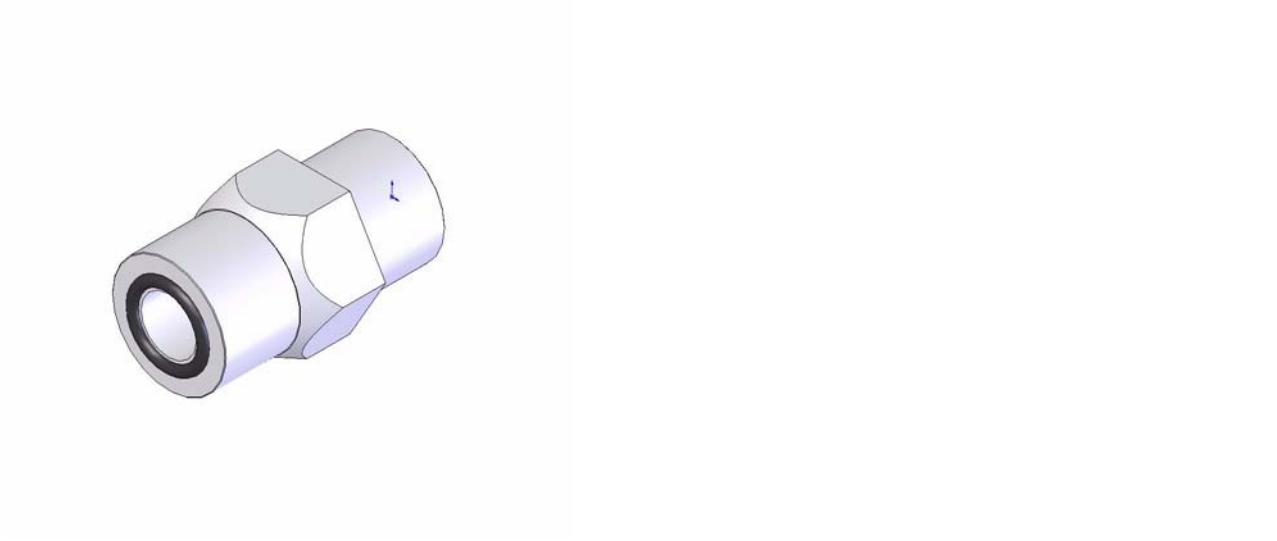
a. The colored cable ties included in the kit are used to identify the hydraulic hoses. Place identical colored cable ties at the ends of each hydraulic hose to positively identify the hose.

The suggested hose color assignments are as follows:
Pressure - Red
Tank - Green
LS - Grey
Steer Out Right- Yellow
Steer Out Left- Orange
Steer In Right - Yellow and Blue
Steer In Left - Orange and Blue

Check Valve Configuration

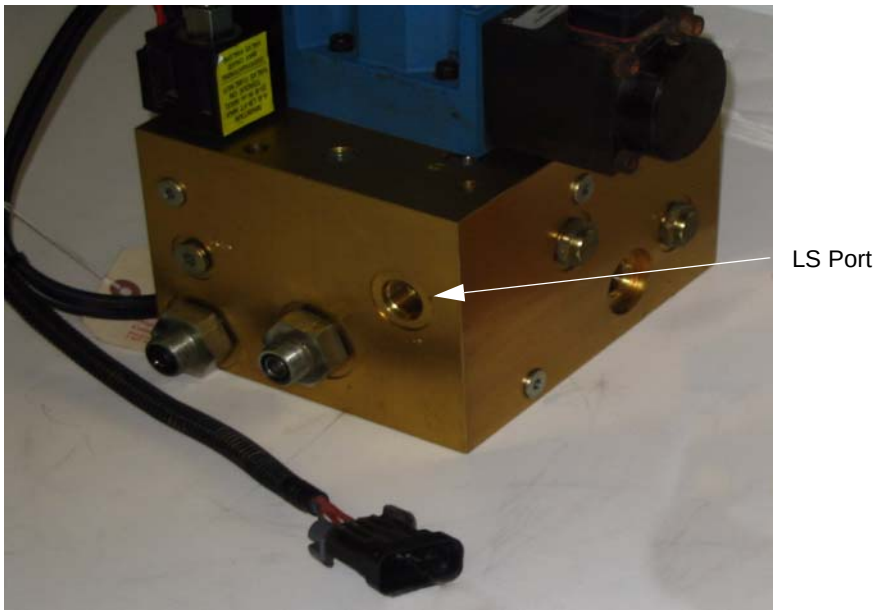
1. Before installing the Steering Valve on the vehicle, you must first install a Check Valve on the Load Sense port (**LS**). The Check Valve looks like a normal hose adapter, but has an internal spring. See *Figure 2-2*.

Figure 2-2 Check Valve



2. Remove the hose adapter on the **LS** port and replace it with the Check Valve provided in the hose kit. See *Figure 2-3*.

Figure 2-3 Replace Check Valve

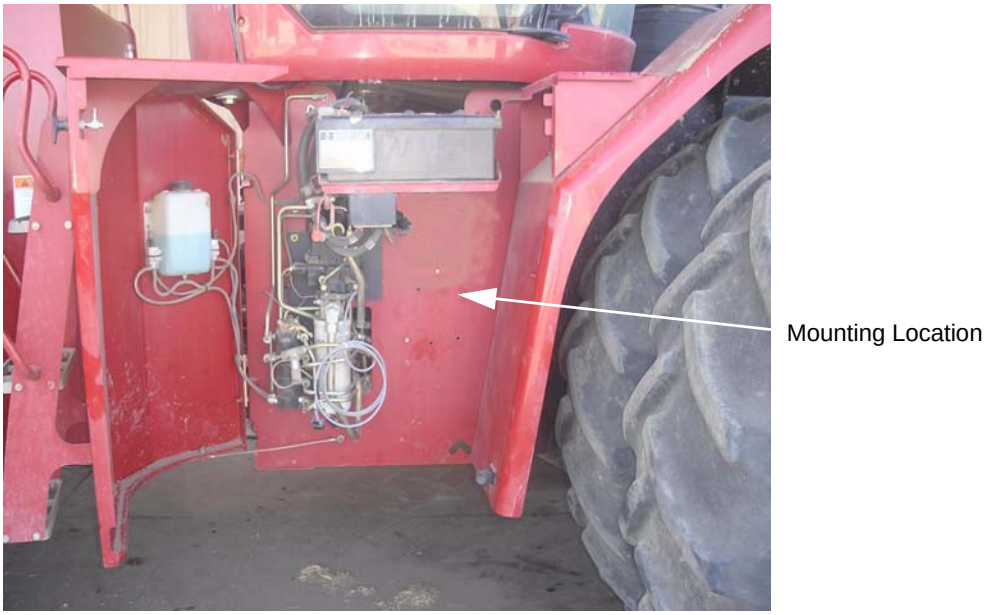


Install the Steering Valve Bracket

1. Locate the mounting position for the Steering Valve on the right side of the tractor under the battery and behind a swinging door panel. See *Figure 2-4*.

Note: You will have to drill three holes to mount the Steering Valve directly to the steel panel. See *Figure 2-5*.

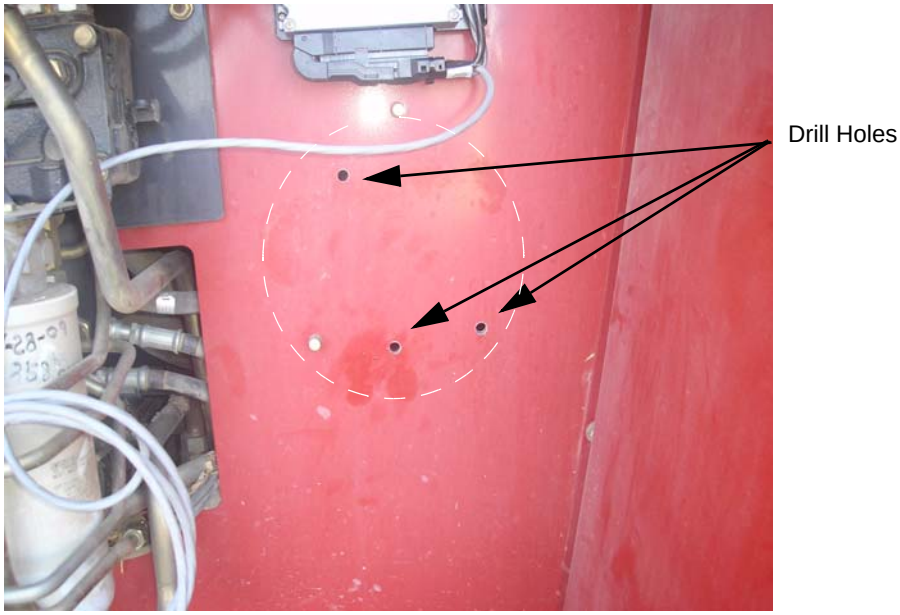
Figure 2-4 Steering Valve Mounting Position



2. Mark the position for drilling three holes using the Steering Valve as a template (see *Figure 2-5*). The Steering Valve must be orientated with the **P**, **T**, and **LS** ports facing down towards the ground. Allow clearance around the Steering Valve for routing hoses.
3. Drill three 7/16” (11mm) holes using a portable drill. See *Figure 2-5*.

Note: Before drilling, check for hoses, cables, or other parts on the back side of the panel you will be drilling.

Figure 2-5 Drill Mounting Holes



Note: STX Quadtrac tractors do not provide the same size mounting surface for the valve. When installing the valve on an STX Quadtrac tractor, mount the valve on the right mud guard inclined surface. Drill three holes as required to secure the valve to the mudguard.

4. Mount the Steering Valve against the steel panel and secure using the three 3/8” Allen screws and locknuts provided with the Steering Valve. See *Figure 2-6*.

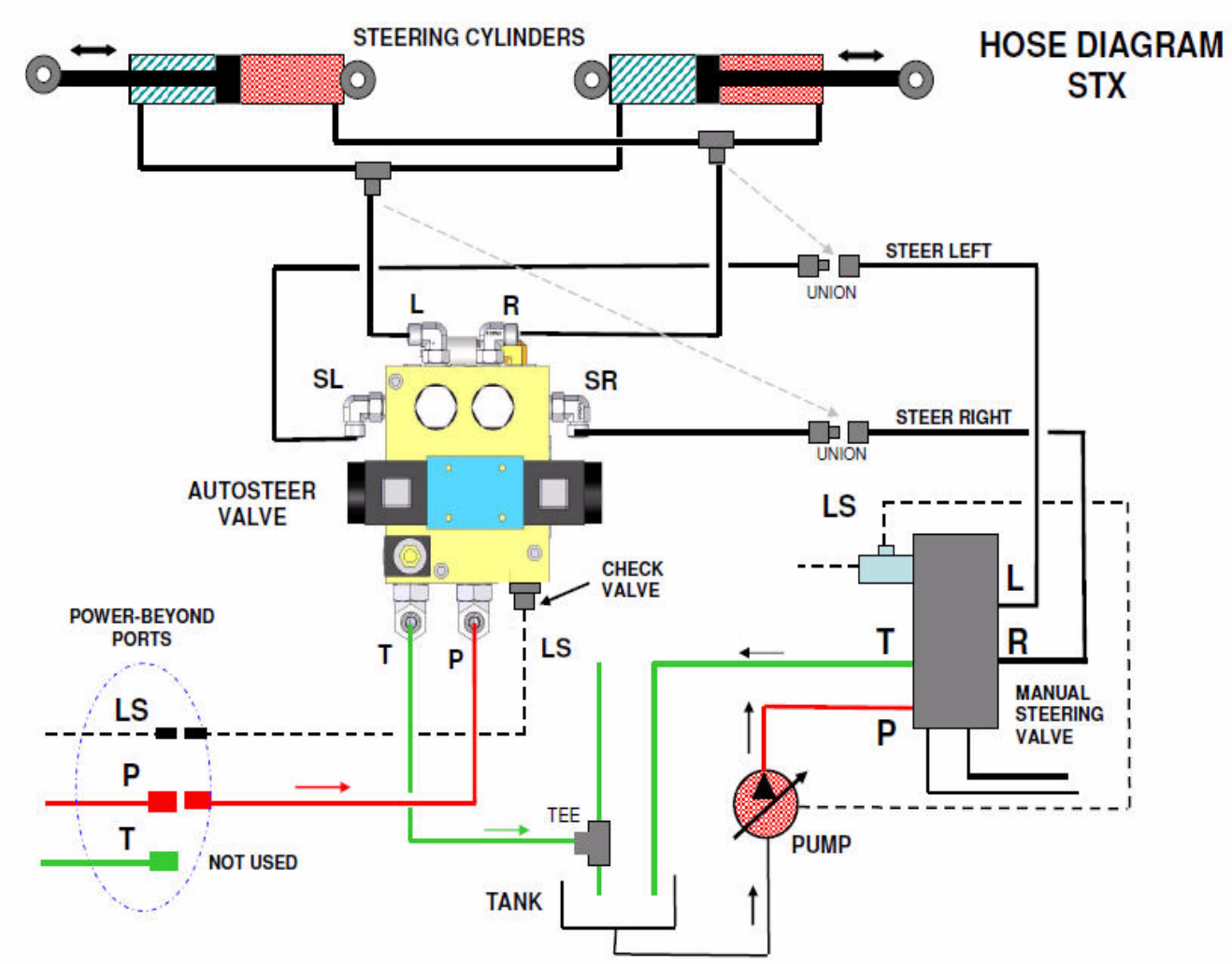
Figure 2-6 Steering Valve Mounted

Hydraulic Hose Connection Procedures

Figure 2-7 shows the hydraulic connections. You can refer to these diagrams as you are connecting the hydraulic components. The hydraulic hose connection procedures are contained in the following sub-sections:

- *Pressure Hose Connection*
- *Tank Hose Connection*
- *Load Sense Hose Connection*
- *Steering Valve Right and Left Steering Hose Connections*

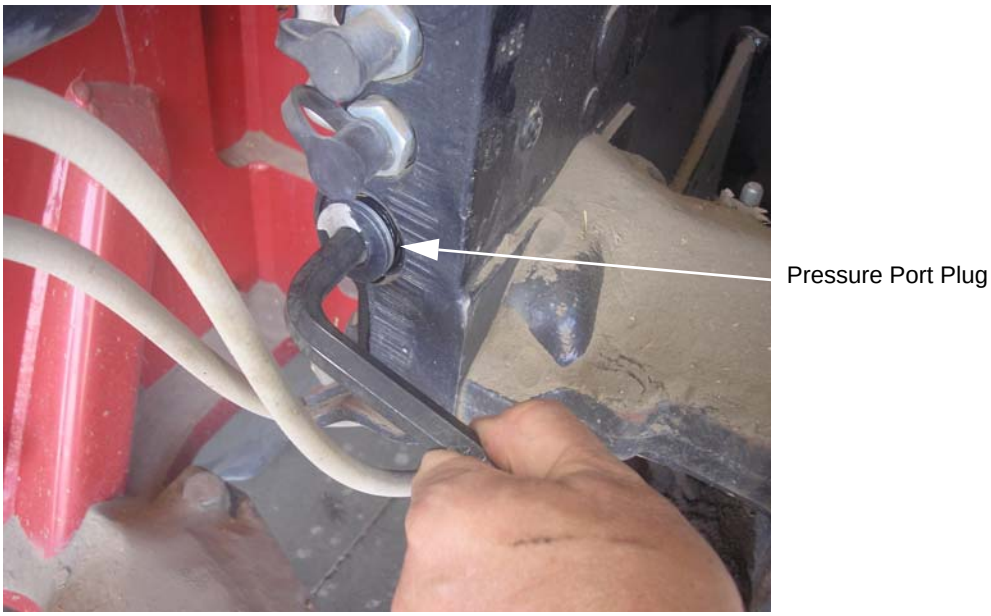
Figure 2-7 Hydraulic Hose Connection Diagram



Pressure Hose Connection

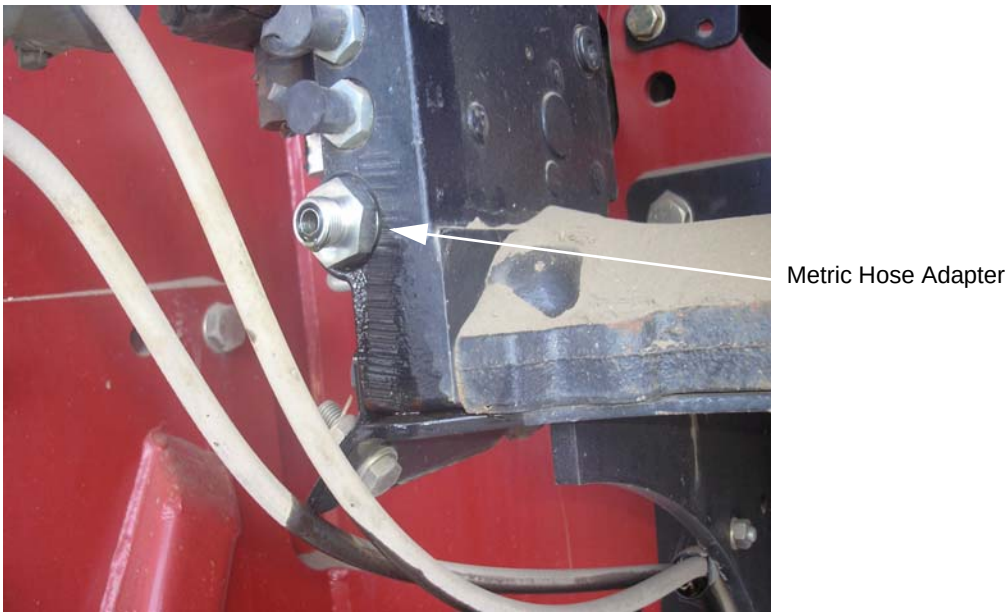
1. Identify the Pressure port in the Power Beyond system on the back of the tractor. Use a 12mm hex key to remove the plug on the Pressure port (identified as **P**). See *Figure 2-8*.

Figure 2-8 Remove Pressure Port Plug



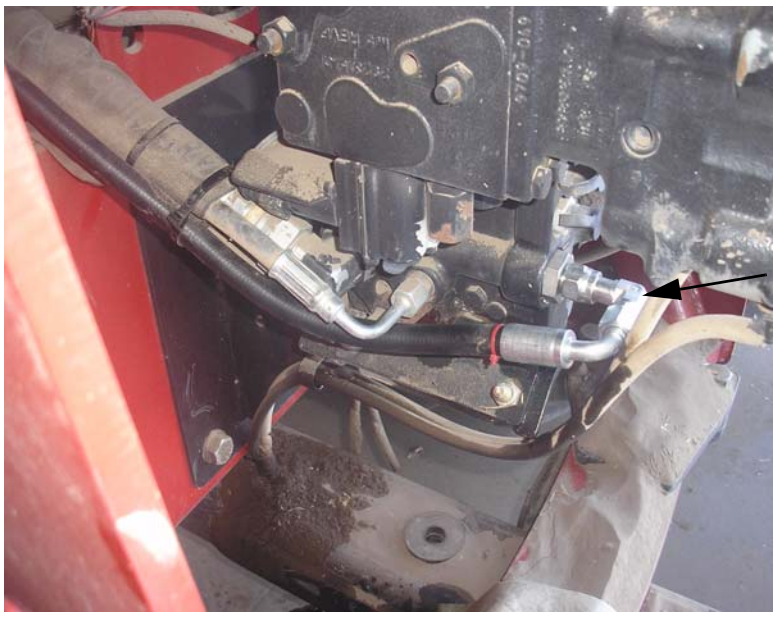
2. Install the metric hose adapter provided in the hose kit and tighten using a 32mm wrench. See *Figure 2-9*.

Figure 2-9 Install Metric Hose Adapter



3. Connect the end of the long 1/2” hose to the adapter on the **P** port. Install an elbow adapter on the port as shown in *Figure 2-10* for better hose routing, then connect the Pressure hose.

Figure 2-10 Connect Long Hose to P Port

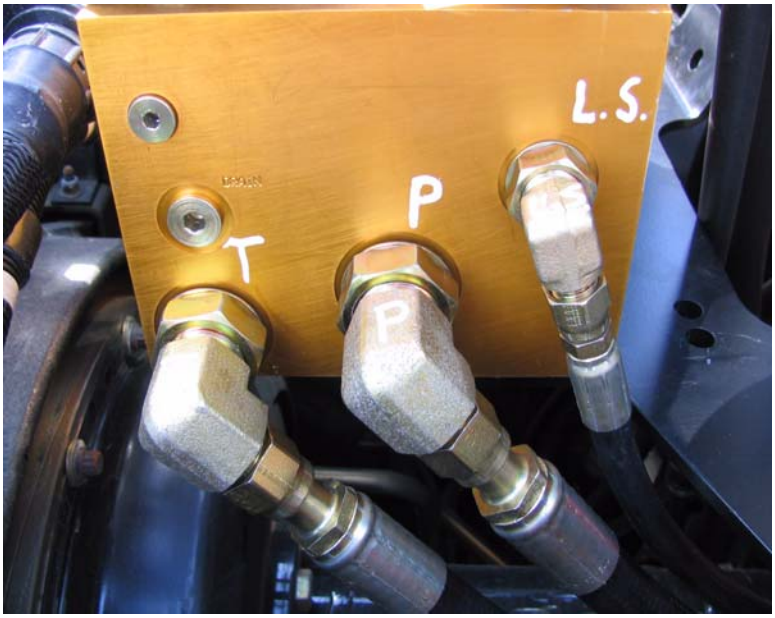


4. Route the Pressure hose towards the Steering Valve on the front of the vehicle. See *Figure 2-11*.

Figure 2-11 Route Pressure Hose

5. Connect the other end of the hose to the Pressure port (**P**) under the Steering Valve. See *Figure 2-12*.

Figure 2-12 Steering Valve Ports Connections



6. Check every hose individually and confirm that both ends are connected to the correct ports.
7. Refer to the hose diagram in *Figure 2-7* to ensure proper connection.
8. Tighten all hose fittings and adapters.
9. Check and secure all hoses using nylon cable ties.

Note: To avoid hose damage, hoses must not drop below the vehicle frame and must not contact moving parts or hot parts such as exhaust manifolds.

Tank Hose Connection

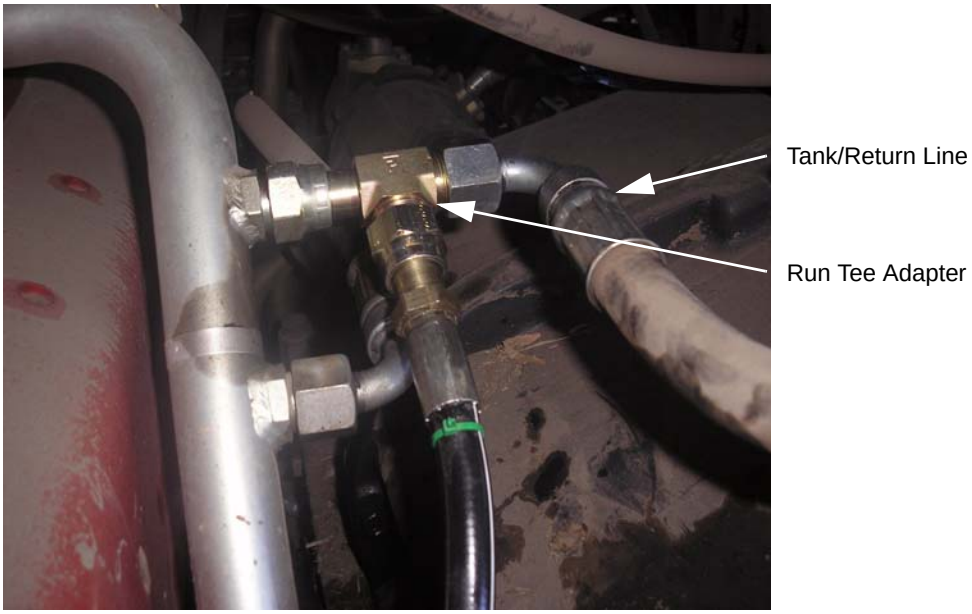
1. Identify the Tank/Return line on the tractor. It is located under the cab on the left side just next to the oil reservoir. See *Figure 2-13*.

Note: This is where the Tank hose will be connected.

Figure 2-13 Identify the Tank/Return Line

2. Open the hose connection and install the large Run Tee adapter provided in your hose kit. Re-connect the vehicle hose to the end of the Run Tee, then connect the AutoSteer Tank hose to the side of the Run Tee as shown in *Figure 2-14*.

Figure 2-14 Install Large Run Tee Adapter



3. Route the Tank hose towards the Steering Valve and connect the other end to the Tank (**T**) port under the Steering Valve. See *Figure 2-12*.
4. Check every hose individually and confirm that both ends are connected to the correct ports.
5. Refer to the hose diagram in *Figure 2-7* to ensure proper connection.
6. Tighten all hose fittings and adapters.
7. Check and secure all hoses using nylon cable ties.

Note: To avoid hose damage, hoses must not drop below the vehicle frame and must not contact moving parts or hot parts such as exhaust manifolds.

Load Sense Hose Connection

The AutoSteer Load Sense hose is connected to the vehicle Power Beyond system Load Sense port.

1. Identify the tractor Power Beyond system Load Sense port. The port is identified as **LS**.

Note: If the tractor is using the power beyond system for powering other hydraulic implements, you may have to install a shuttle valve to share the single LS port. Contact your AutoSteer dealer for details.

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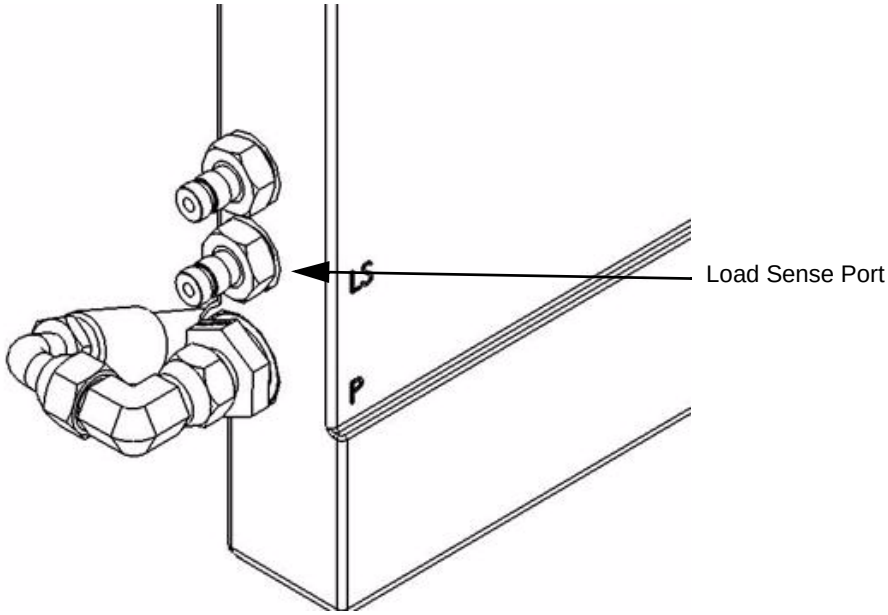
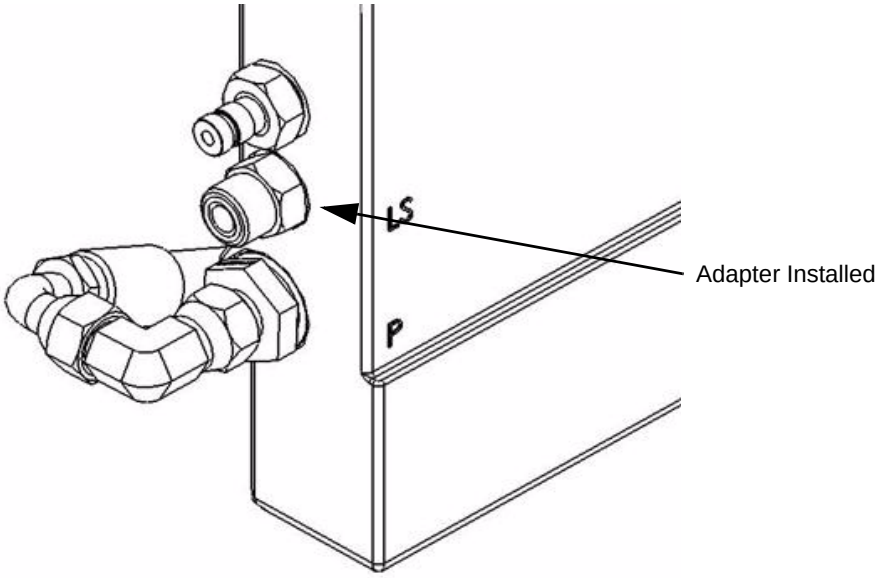
2. Remove the existing plug or quick coupler on the **LS** port. See *Figure 2-15*.

Figure 2-15 Power Beyond Valve



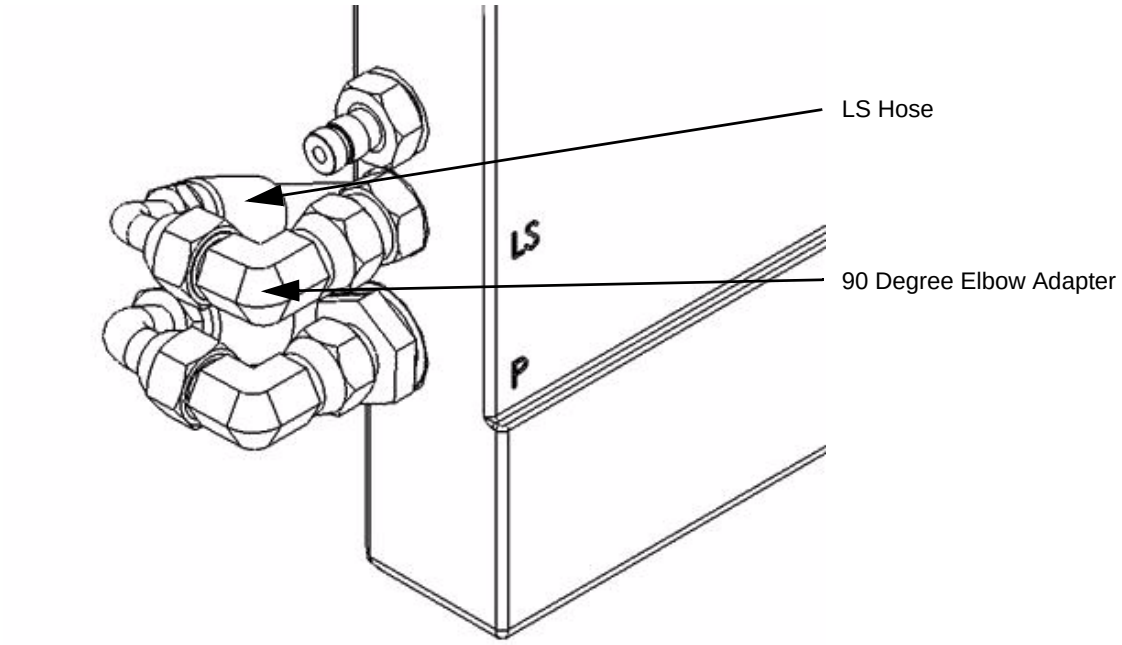
3. Install an M18 hose adapter on the LS port. The adapter is provided in the hose kit. See *Figure 2-16*.

Figure 2-16 LS Port M18 Adapter Installed



4. Install an elbow adapter on the LS hose adapter as shown in *Figure 2-17*.

Figure 2-17 Adapter Elbow on LS Port



5. Connect the 90 degree fitting on the end of the long 3/8” LS hose to the elbow adapter.

6. Route the LS hose towards the front of the tractor along the side of the pressure hose installed previously.

7. Route the Load Sense hose towards the Steering Valve and connect it to the Check Valve that was previously installed (see *Figure 2-3*) on the Load Sense (**LS**) port under the AutoSteer valve. See *Figure 2-12*.

8. Check every hose individually and confirm that both ends are connected to the correct ports.

9. Refer to the hose diagram in *Figure 2-7* to ensure proper connection.

10. Tighten all hose fittings and adapters.

11. Check and secure all hoses using nylon cable ties.

Note: To avoid hose damage, hoses must not drop below the vehicle frame and must not contact moving parts or hot parts such as exhaust manifolds.

Steering Valve Right and Left Steering Hose Connections

1. Identify the Right and Left Steering hose connections on the right side of the tractor just above the steering cylinder. See *Figure 2-18*.

Figure 2-18 Identify the Steering Hose Connections

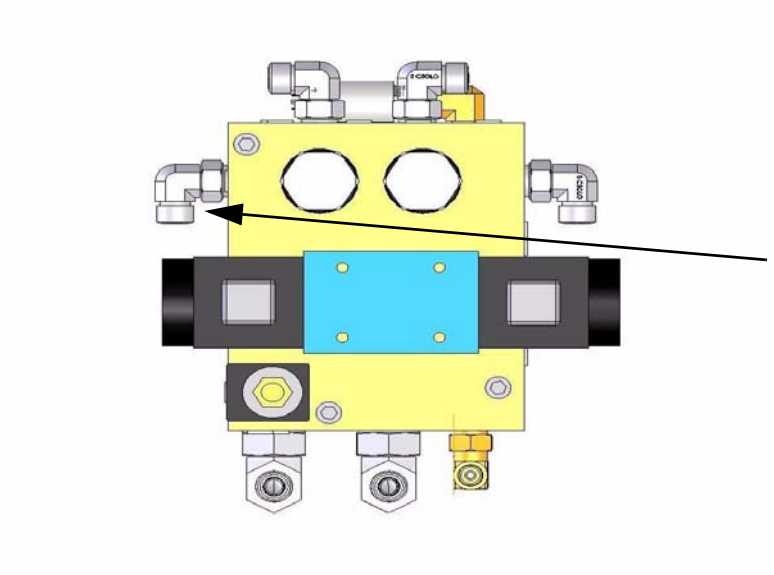
2. Identify the two Steering hoses coming from the front of the vehicle and connecting to the two tee adapters that branch off to the two steering cylinders. These two hoses are the main Right and Left Steering hoses that will be disconnected from the tee adapters to complete the Steering Valve installation. See *Figure 2-19*.

Note: Refer to the hose diagram to understand the required hose connections before proceeding. See *Figure 2-7*.

Figure 2-19 Identify Steering Hoses

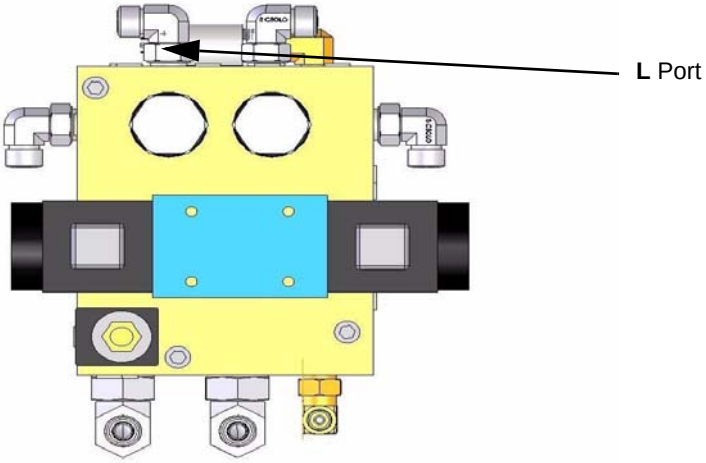
3. Disconnect the hose on your right, which is the Left Steering hose. Connect this hose to a short AutoSteer extender hose and connect the extender hose to the port labeled **SL** on the Steering Valve. See *Figure 2-20*.

Figure 2-20 Connecting Steering Hoses (SL)



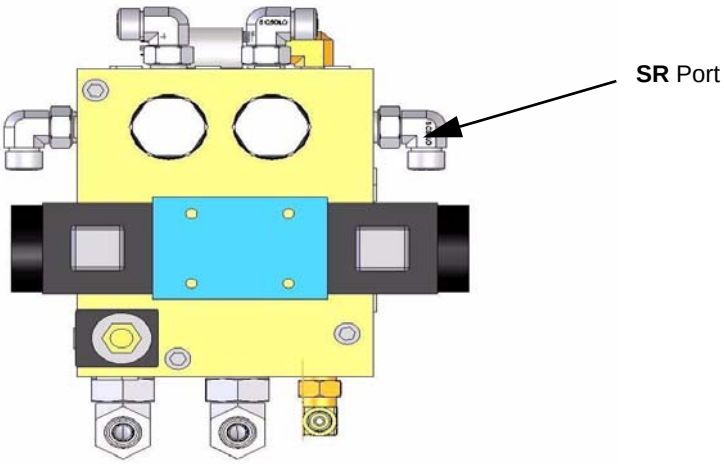
4. Connect an AutoSteer Steering Valve hose from the tee adapter that was just opened to the port labeled **L** on the Steering Valve. This completes the installation of the two Left Steering hoses. See *Figure 2-21*.

Figure 2-21 Connecting Steering Hoses (L)



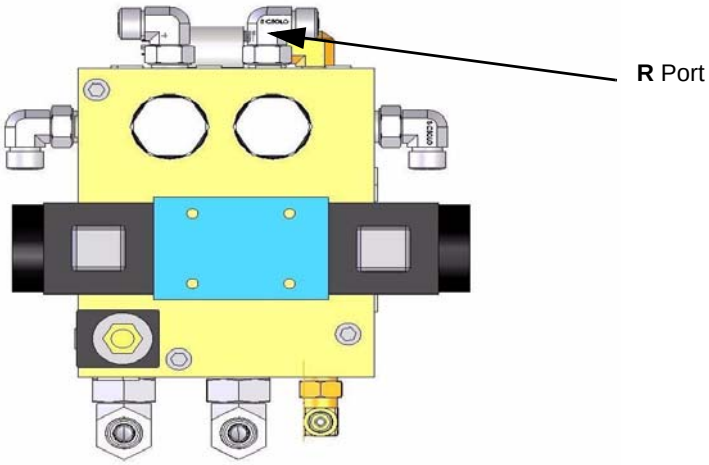
5. Disconnect the hose on your left, which is the Right Steering hose. Connect this hose to a short AutoSteer extender hose and connect the extender hose to the port labeled **SR** on the Steering Valve. See *Figure 2-22*.

Figure 2-22 Connecting Steering Hoses (SR)



6. Connect an AutoSteer Steering Valve hose from the tee adapter that was just opened to the port labeled **R** on the Steering Valve. This completes the installation of the two Right Steering hoses. See *Figure 2-23*.

Figure 2-23 Connecting Steering Hoses (R)



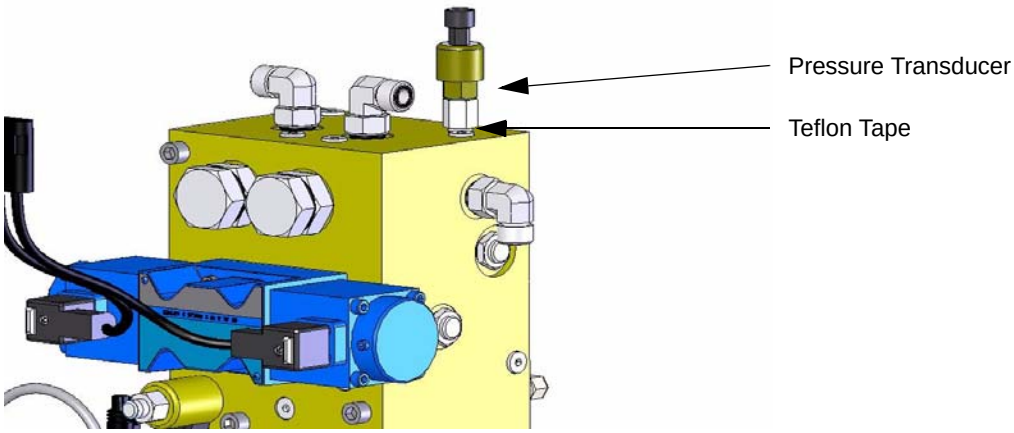
7. Check every hose individually and confirm that both ends are connected to the correct ports.
8. Refer to the hose diagram in *Figure 2-7* to ensure proper connection.
9. Tighten all hose fittings and adapters.
10. Check and secure all hoses using nylon cable ties.

Note: To avoid hose damage, hoses must not drop below the vehicle frame and must not contact moving parts or hot parts such as exhaust manifolds.

Pressure Transducer Installation

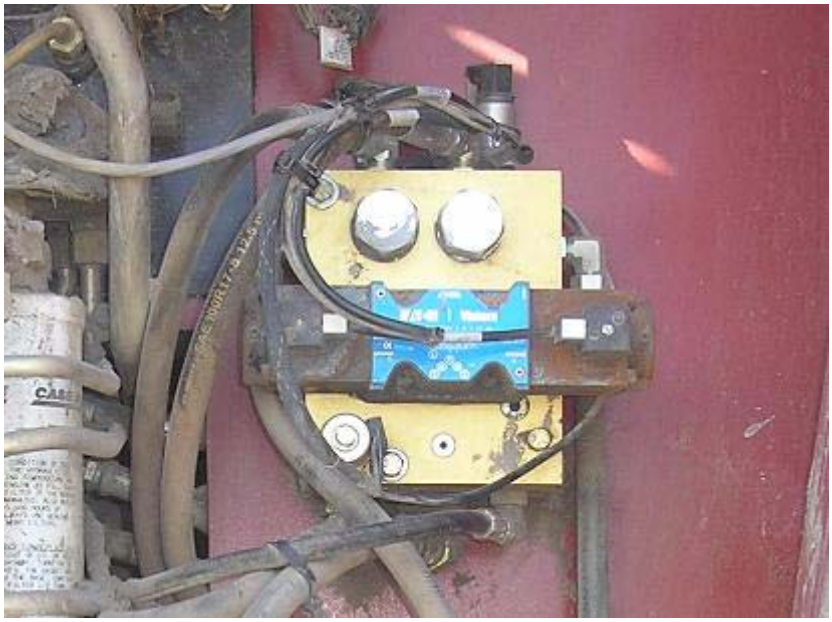
1. Apply 2-3 turns of teflon tape on the NPT/ORB thread adapter. See *Figure 2-24*.
2. Install the NPT/ORB thread adapter on the Steering Valve. See *Figure 2-24*.
3. then install the Pressure Transducer on the adapter. See *Figure 2-24*.

Figure 2-24 Pressure Transducer Installed



4. Connect the 3-pin connector from the Steering Valve harness to the Pressure Transducer. The connector has a latch and must be correctly orientated. See *Figure 2-25*.

Figure 2-25 AutoSteer Valve Installed



Steering Valve Installation Checklist

1. Mounting screws that secure the Steering Valve are tight.
2. Pressure hose is connected to correct port on Steering Valve and Power Beyond.
3. Tank hose connected to correct port on Steering Valve and Tank/Return line.
4. Check Valve was installed on Steering Valve LS port.
5. LS hose connected to Check Valve and vehicle.
6. Right Steer hoses connected correctly at both ends.
7. Left Steer hoses connected correctly at both ends.
8. Pressure Transducer installed and tight.
9. Checked that all hose fittings are tight.
10. Checked hose routing and cable ties on all hoses.

Wheel Angle Sensor (WAS) Installation

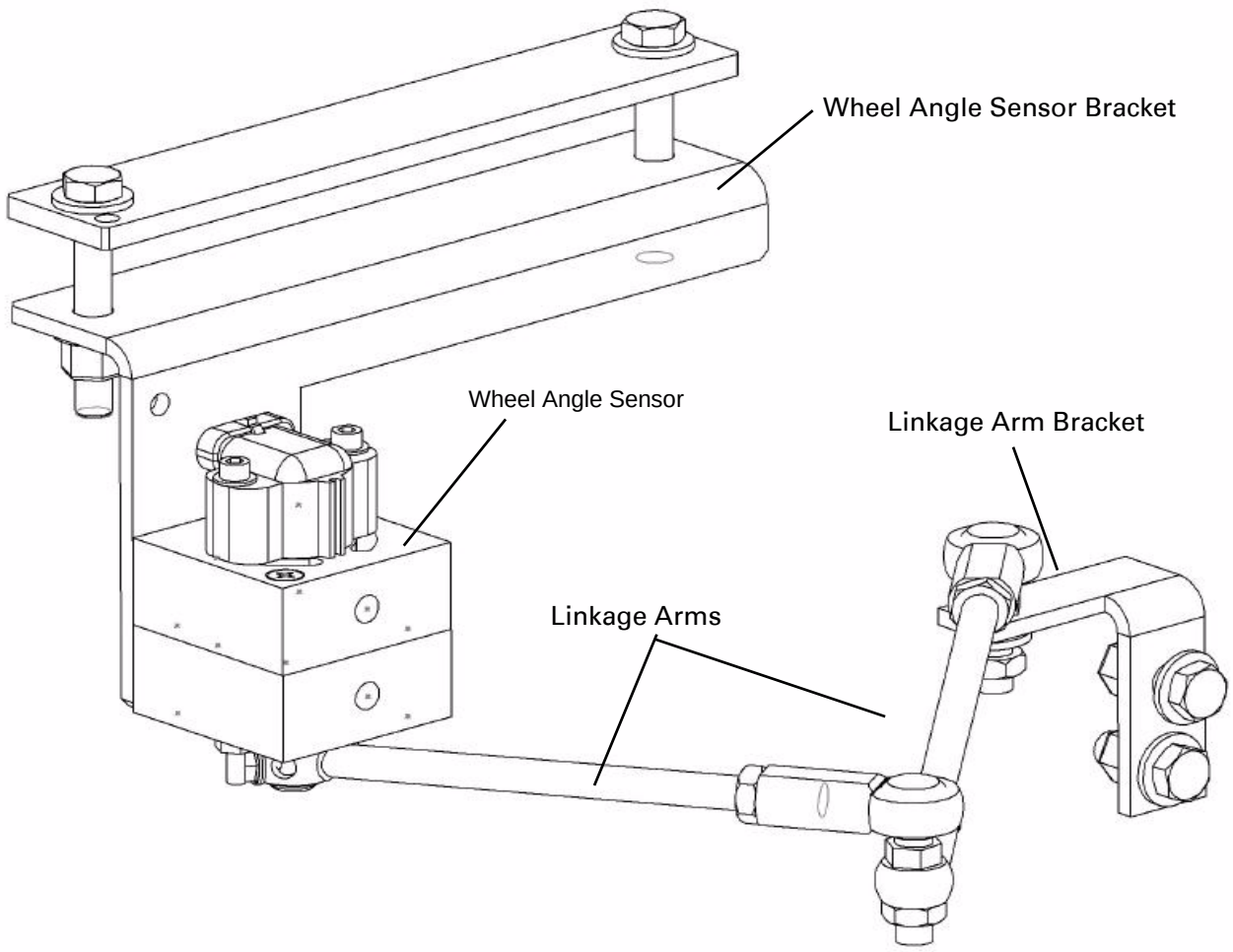
This **Wheel Angle Sensor Installation** chapter information is provided in the following sections:

- *Mounting Wheel Angle Sensor Hardware*
- *Cutting Linkage Rods to Length*
- *Assembling Linkage Rod Hardware*
- *Attaching and Adjusting Wheel Angle Sensor Linkage Rods*

Note: The Wheel Angle Sensor is optional equipment and is not provided with the installation kit. The Wheel Angle Sensor installation instructions are provided for special installations, when required.

The Wheel Angle Sensor components are shown in *Figure 3-1*.

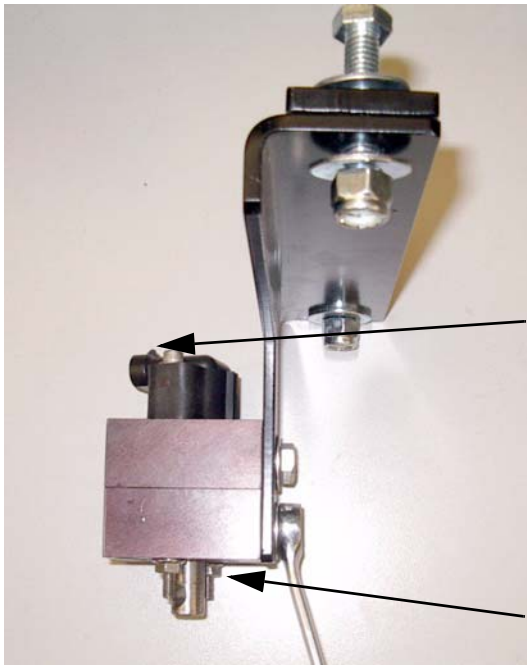
Figure 3-1 Wheel Angle Sensor Components



Mounting Wheel Angle Sensor Hardware

1. Preassemble the Wheel Angle Sensor on the bracket before vehicle installation. See *Figure 3-2*.

Figure 3-2 Attaching the Wheel Angle Sensor to the Bracket



Cutting Linkage Rods to Length

Note: Before cutting the linkage rods, verify the Wheel Angle Sensor brackets will attach to the vehicle as shown in this manual and they are attached the correct distance from any reference points shown. If this is not possible, do not cut the rods until it is determined if these lengths will work for your installation. Due to possible variations in the mounting positions, these measurements could be different. These measurements are provided as a reference only. The installer is responsible for ensuring the rods are cut to the proper length.

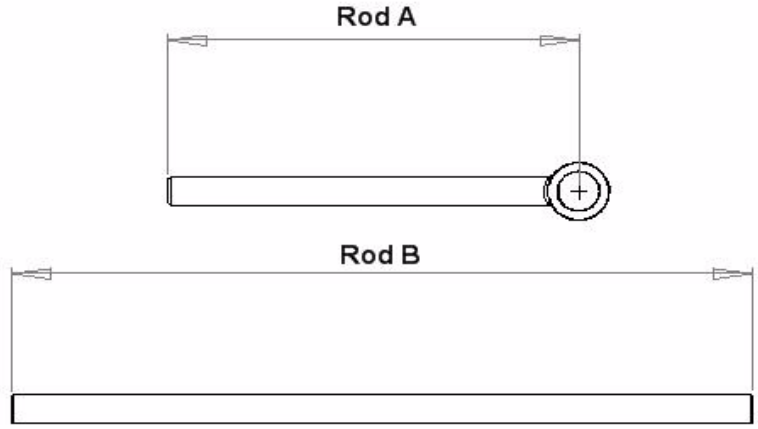
1. Measure and mark the two linkage rods for cutting, according to the length shown in *Table 3-1*.

Note: *Figure 3-3* shows the measurement points used to properly cut the linkage rods.

Table 3-1 Linkage Rod Cut Lengths

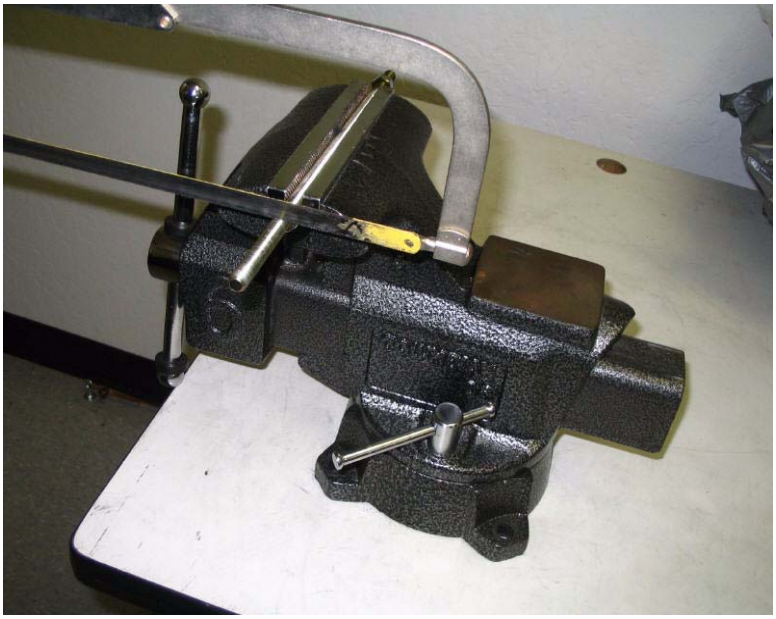
Item	Length
Rod A	5.5 inches (140 mm)
Rod B	8.5 inches (216 mm)

Figure 3-3 Linkage Rod Cut Length Measurement Points



2. Use a hack saw to cut the linkage rod to length while it is held in a bench vise. See *Figure 3-4*.

Figure 3-4 Linkage Rod Cutting

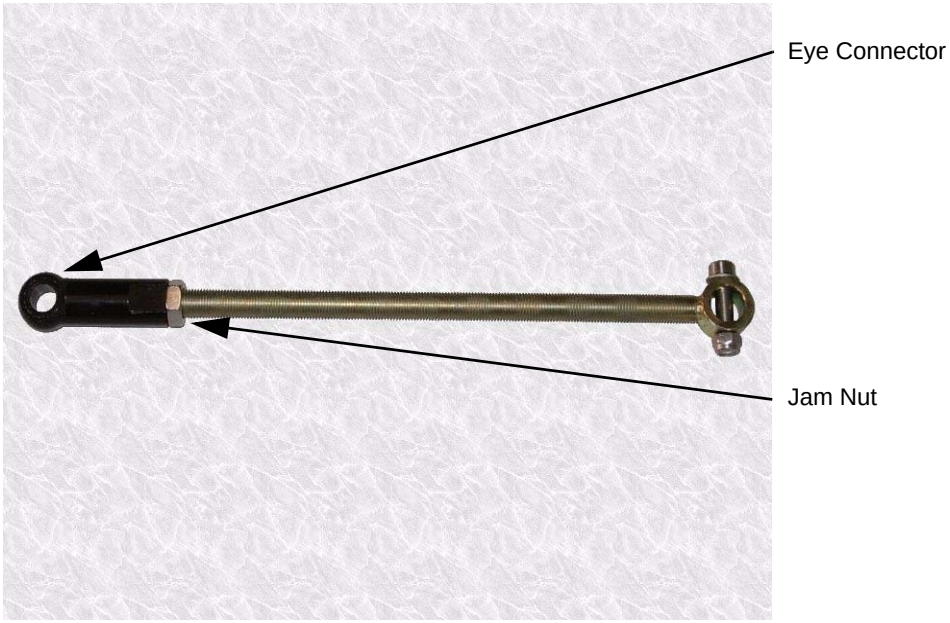


Assembling Linkage Rod Hardware

1. Attach a jam nut to the end of Rod A. See *Figure 3-5*.
2. Connect the eye connector to the end of the Wheel Angle Sensor rod. As shown in *Figure 3-5*.

Note: The threaded rods must be cut to the correct lengths before final assembly.

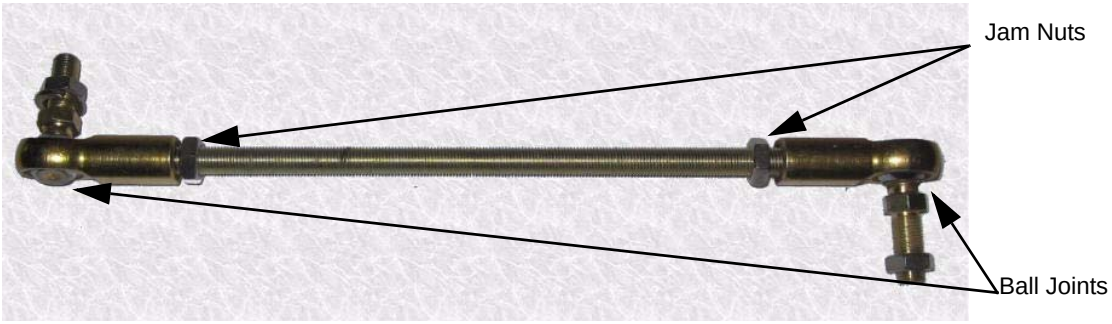
Figure 3-5 Rod A Assembled



3. Attach the jam nuts to each end of linkage Rod B
4. Attach the ball joints to both ends of the linkage arm as shown in *Figure 3-6*.

Note: The bolts for the ball joints should be facing the opposite direction as shown in *Figure 3-6*.

Figure 3-6 Linkage Rod Assembled

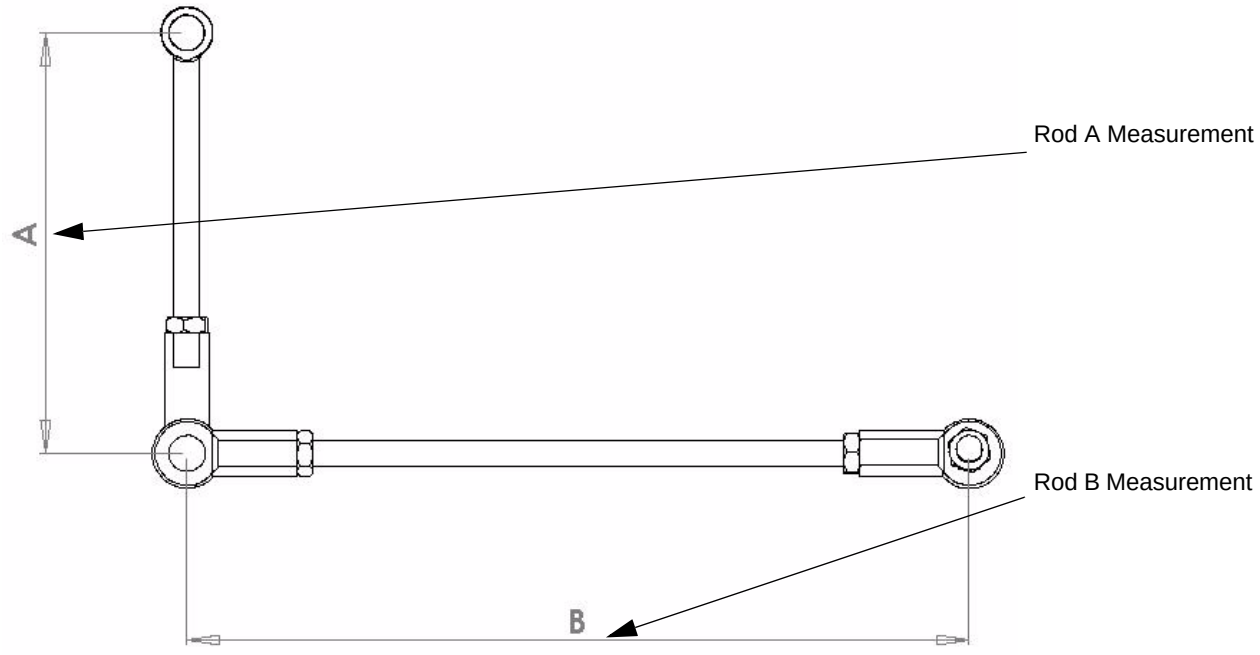


Note: The linkage rod after-assembly center-to-center lengths are shown in *Table 3-2*. *Figure 3-7* shows the measurement points for the assembled linkage rods.

Table 3-2 Assembled Linkage Rod Length

Item	Length
Rod A	6.5" (165mm)
Rod B	10" (254mm)

Figure 3-7 Linkage Rod Measurement Points (Assembled)

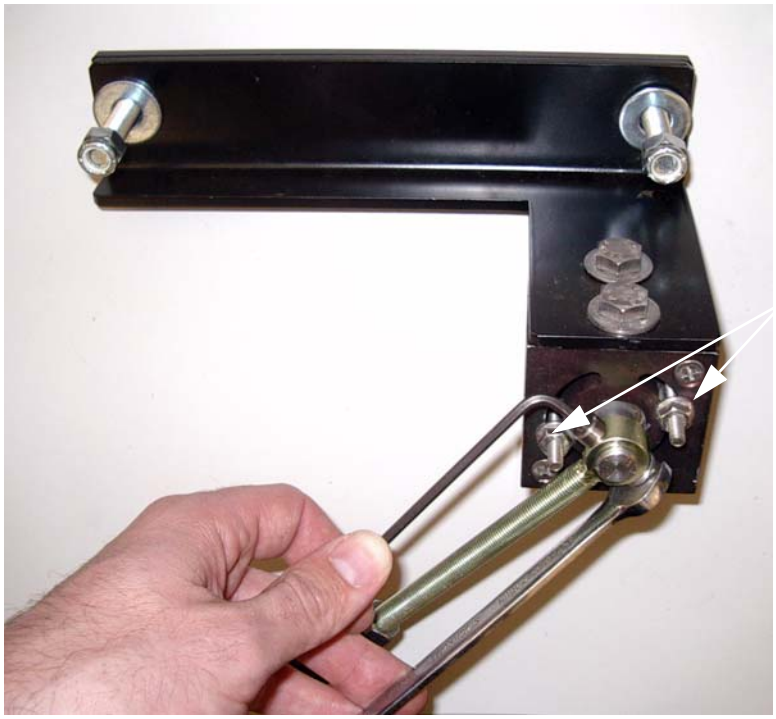


Attaching and Adjusting Wheel Angle Sensor Linkage Rods

1. Install the short linkage arm on the Wheel Angle Sensor shaft.
2. Attach the Wheel Angle Sensor linkage rod to the Wheel Angle Sensor. See *Figure 3-8*.

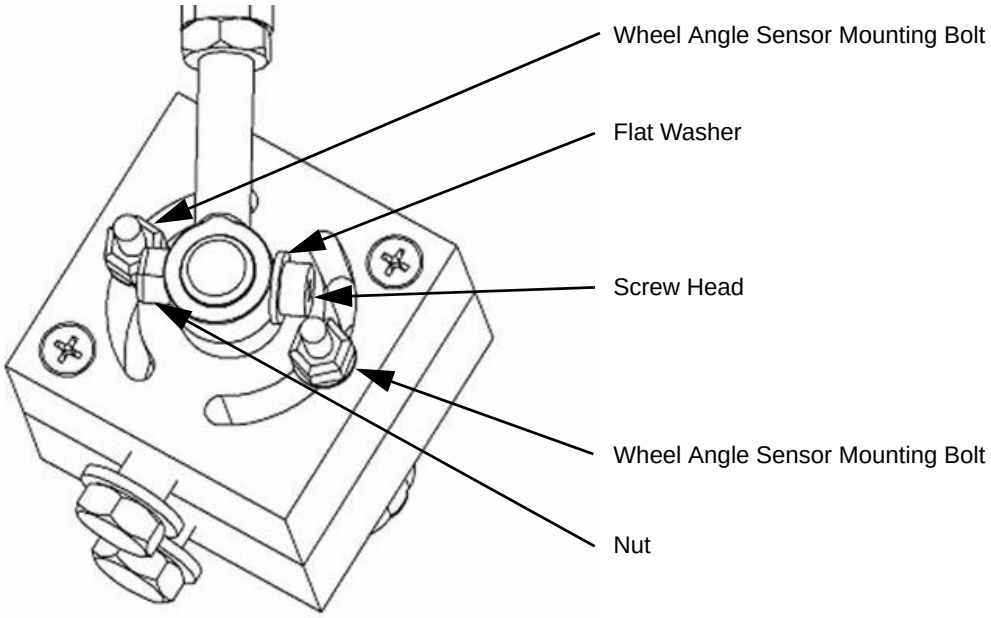
Note: Leave the Wheel Angle Sensor mounting bolts loose so the Wheel Angle Sensor can be rotated after installation on the vehicle.

Figure 3-8 Attaching the Linkage Arm to Wheel Angle Sensor



3. Ensure a flat washer is placed under the screw head when attaching the linkage rod to the Wheel Angle Sensor shaft. See *Figure 3-9*.

Figure 3-9 Washer on Shaft Screw



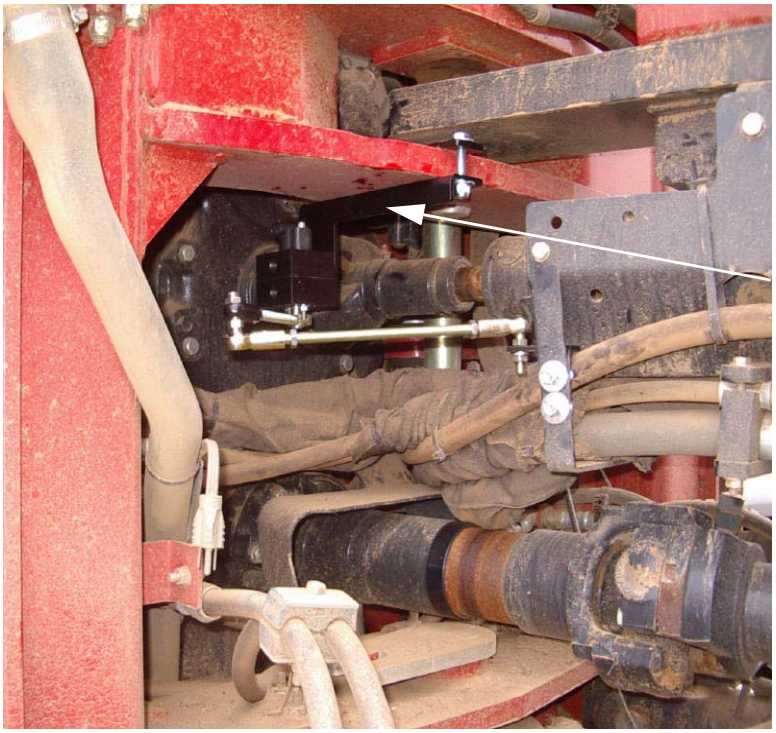
Note: The washer should be on the bolt head side and not the nut side of the assembly.

Note: Do not turn the steering system or drive the vehicle before the Wheel Angle Sensor has been adjusted using the AutoSteer Calibration screens. The potentiometer can only rotate a maximum of 180 degrees and if it is rotated beyond its mechanical stops, it will be permanently damaged.

4. Attach the Wheel Angle Sensor bracket to the vehicle frame in the position shown in *Figure 3-10*, using the supplied bolts, nuts and washers.

Note: *Figure 3-10* shows a complete Wheel Angle Sensor installation. However, in this installation step the second linkage rod should not be attached.

Figure 3-10 Wheel Angle Sensor Bracket Installed



5. Tighten the mounting bolts using a 9/16” socket and ratchet with a 9/16” socket.

Note: Do not attach the remaining linkage arm.

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6. Install the linkage bracket using the supplied bolts, nuts and washers. See *Figure 3-11*.
7. Tighten the linkage bracket bolts using a 9/16” socket and ratchet with a 9/16” wrench.

Figure 3-11 Linkage Bracket Mounted

8. Install the long threaded linkage on the tie rod bracket using a ball joint.
9. Tighten the ball joint to the bracket with a 1/2” and 9/16” wrench.

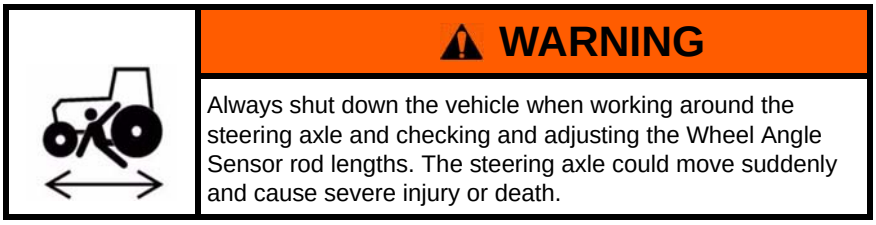
Note: Do not attach linkage rod to Wheel Angle Sensor rod at this time.

---

10. With the linkage rods disconnected, turn the steering wheel so the wheels or tracks are centered (the vehicle will travel straight ahead when moving).
11. Temporarily attach the linkage rods.

Note: Never attach the linkage rods to Wheel Angle Sensor rod and turn the steering system manually or automatically until the fit has been verified. The linkage rods must remain apart while the steering system is turned to the maximum right and left positions and then temporarily attached at these positions. Failure to do this may cause the Wheel Angle Sensor or vehicle to become damaged.

Note: After the linkage rods are assembled in the following steps, they should move freely without touching any other parts and without overextending. Make any necessary adjustments to the linkage rods if there is an interference problem.



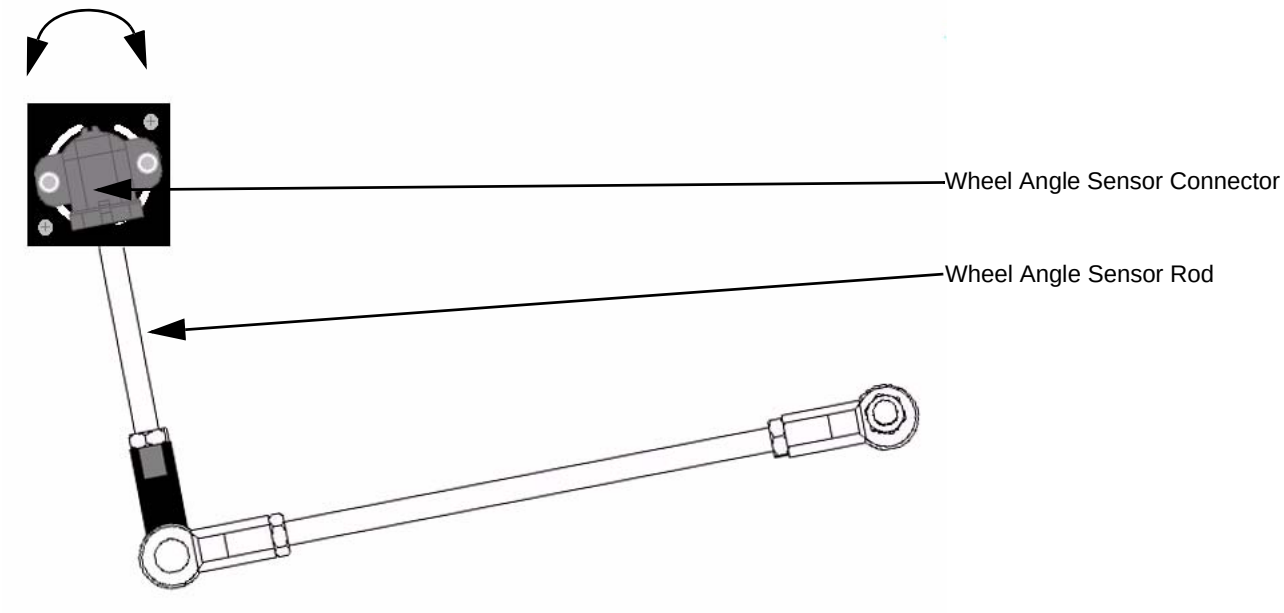
⚠ WARNING

Always shut down the vehicle when working around the steering axle and checking and adjusting the Wheel Angle Sensor rod lengths. The steering axle could move suddenly and cause severe injury or death.

12. Rotate the Wheel Angle Sensor potentiometer on top of the mounting block so that the wire connector is parallel to the Wheel Angle Sensor rod. See *Figure 3-12*.

Note: The vehicle should be parked in a straight ahead position when adjusting the potentiometer angle.

Figure 3-12 Adjusting Potentiometer Angle

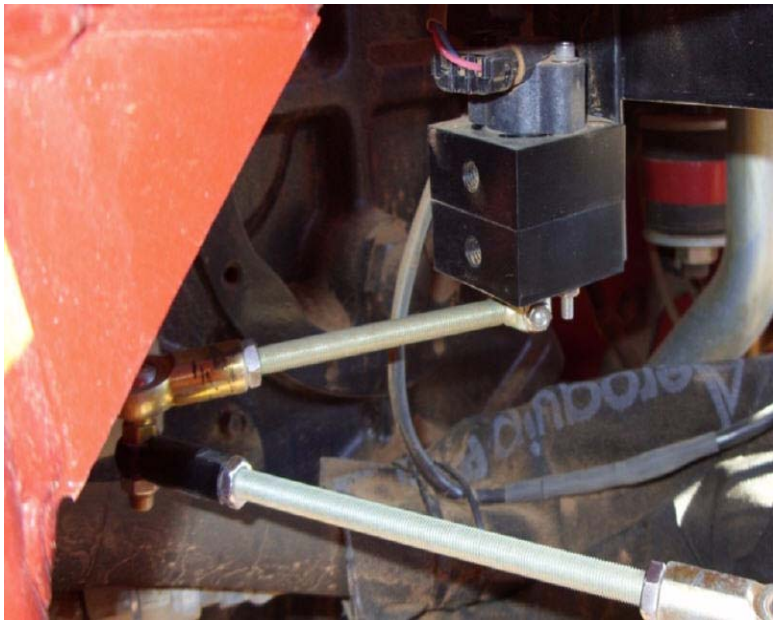


13. Disconnect the linkage rods and turn the steering wheel manually to the full left position.

14. Reattach the linkage assembly and verify that the Wheel Angle Sensor will not be damaged. See *Figure 3-13*.

15. Adjust the rod lengths as necessary.

Figure 3-13 Full Left Wheel Angle Sensor Test

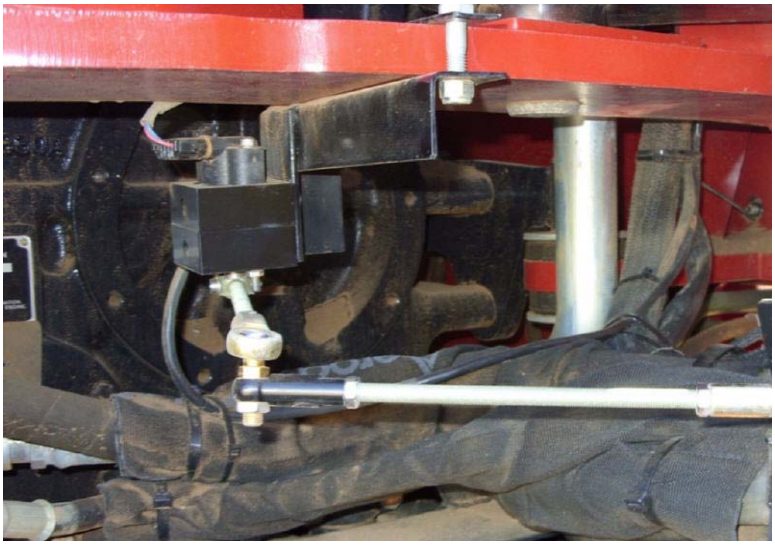


16. Disconnect the linkage rods and turn the steering wheel manually to the full right position.

17. Reattach the linkage assembly and verify that the Wheel Angle Sensor will not be damaged. See *Figure 3-14*.

18. Adjust the linkage rod lengths as necessary.

Figure 3-14 Full Right Wheel Angle Sensor Test

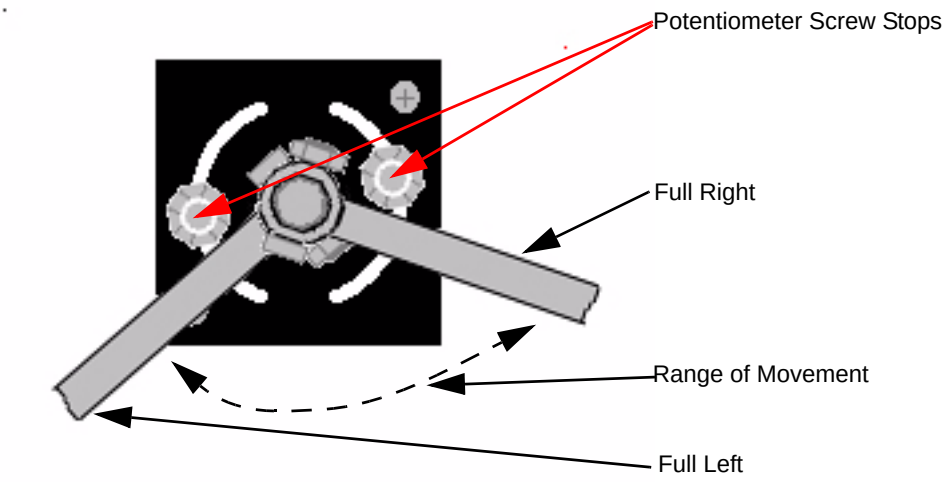


19. Rotate the Wheel Angle Sensor, adjust the length of either linkage arm and/or reposition the Wheel Angle Sensor mounting bracket on the vehicle frame (if necessary) to get the maximum Wheel Angle Sensor movement.

20. Test the remaining linkage arm for length at hard left and hard right to ensure Wheel Angle Sensor travel is not exceeded.

Note: The maximum movement is reached when the Wheel Angle Sensor rod sweeps from approximately 3/16" (5mm) from both stop bolts when the steering system is turned to the maximum right and left positions. See *Figure 3-15*.

Figure 3-15 Maximum Wheel Angle Sensor Movement (as seen from bottom)



Note: An Ohm meter can also be used to determine if there is enough Wheel Angle Sensor movement. Connect the Ohm meter to pins A and B of the Wheel Angle Sensor. Measure the Ohm reading at the maximum left and right position. After subtracting the smaller number from the larger number, there should be at least a 3.75 kilohms change. The reading should also never go below 1.6 kilohms or higher than 6.6 kilohms as this is reaching the limits of the potentiometer and could damage the Wheel Angle Sensor.

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21. When all the adjustments are complete, tighten all linkage rod lock nuts and bolts and the Wheel Angle Sensor rod. See *Figure 3-16*.

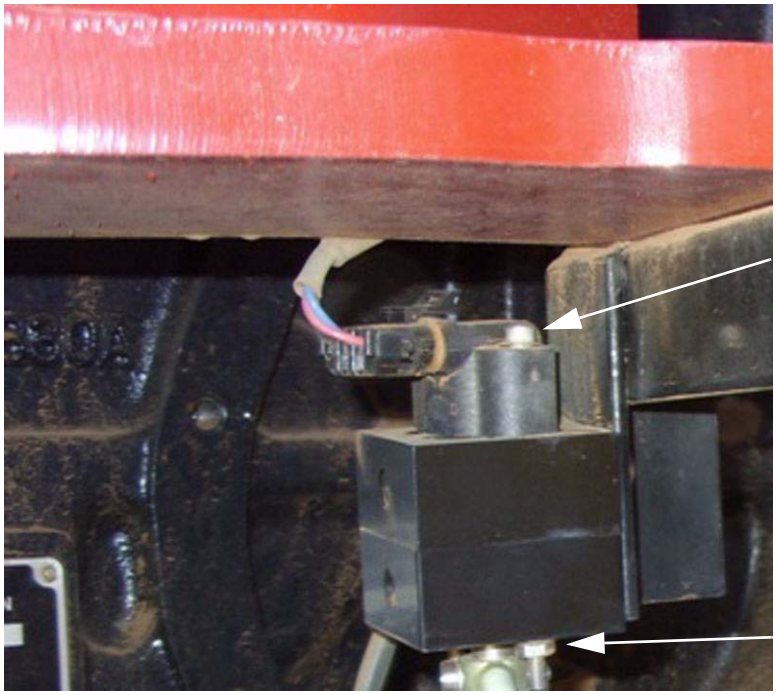
Note: Use a 1/2” and two 9/16” wrenches to tighten the connections.

Figure 3-16 Linkage Rod Ball Joint Bolt (different vehicle shown)

22. Tighten the two screws securing the potentiometer to the Wheel Angle Sensor, after final adjustments. See *Figure 3-17*.

Note: Use a 1/8” hex key and a 3/8” wrench.

Figure 3-17 Potentiometer Mounting Bolts



SA Module Installation

The **SA Module Installation** chapter contains information in the following sections:

- *SA Module Mounting Orientation*
- *Mount the SA Module*

SA Module Mounting Orientation

The SA Module can also only be mounted in certain orientations. *Figure 4-1* shows the correct mounting positions and *Figure 4-2* shows incorrect mounting positions.

Figure 4-1 Correct SA Module Mounting Orientations

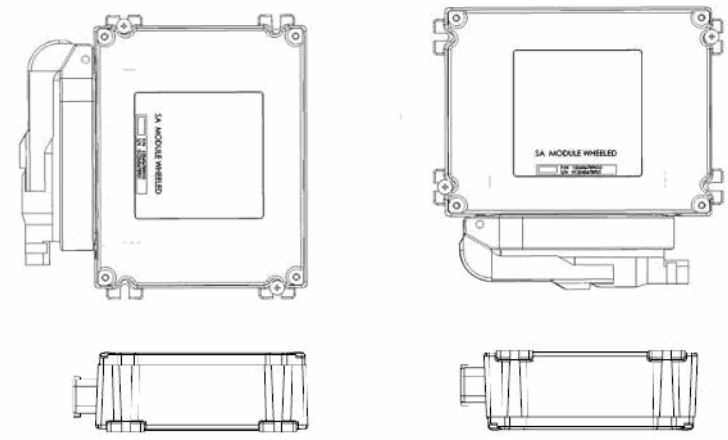
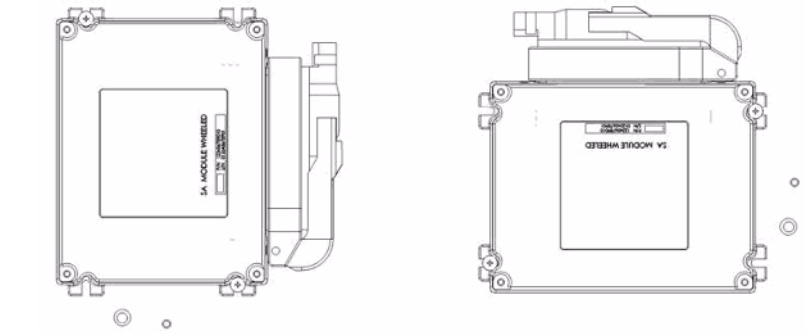


Figure 4-2 Incorrect SA Module Mounting Orientations



Mount the SA Module

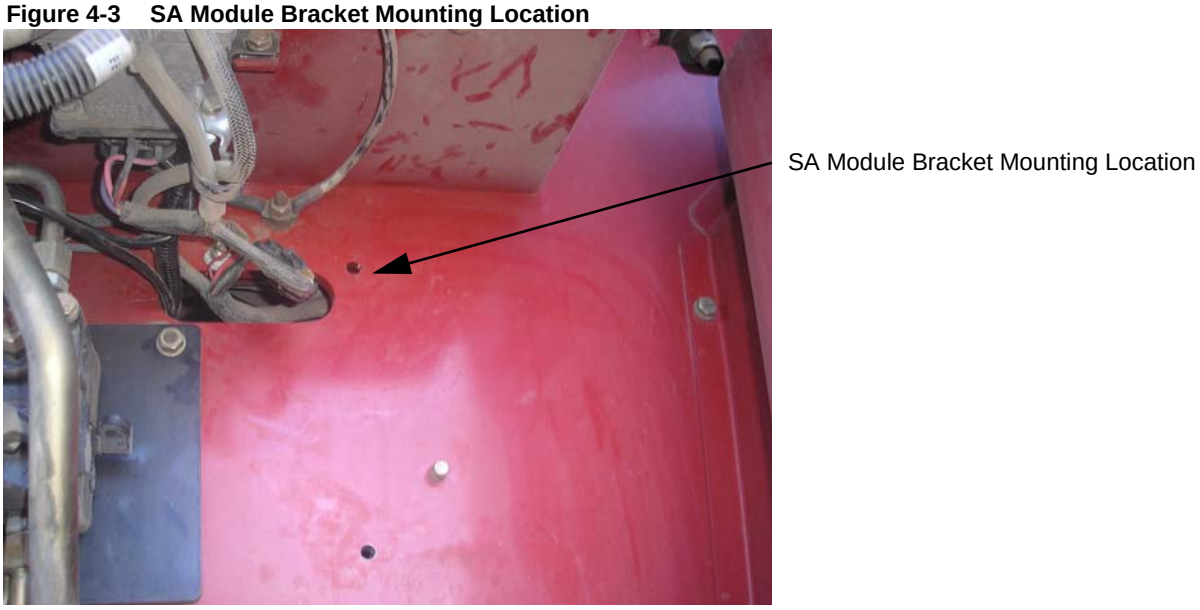
Due to the variety of options available on vehicles and the possible configuration differences, it may be necessary to install the SA Module in location other than the example shown here. If an alternative location is required, choose a location where the SA Module can be protected from damage from moving parts or crop debris and excessive moisture from weather and cleaning equipment.

Note: The SA Module Harness must be routed in a protected position to avoid damage from the moving parts.

Note: The SA Module may be installed in other locations on the vehicle that are more protected from high crops such as corn or cotton.

1. Find the existing hole on the right side of the tractor just above the mounting position of the Steering Valve. This hole will be used to mount the SA Module Bracket. See *Figure 4-3*.

Figure 4-3 SA Module Bracket Mounting Location



2. Mount the SA Module Bracket to the existing hole using the hex bolt and locknut provided in your kit. See *Figure 4-4*.
3. Mount the SA Module onto the Bracket and secure using four Phillips screws provided. See *Figure 4-4*.

Figure 4-4 SA Module Mounted (shown with SA Module Harness attached)

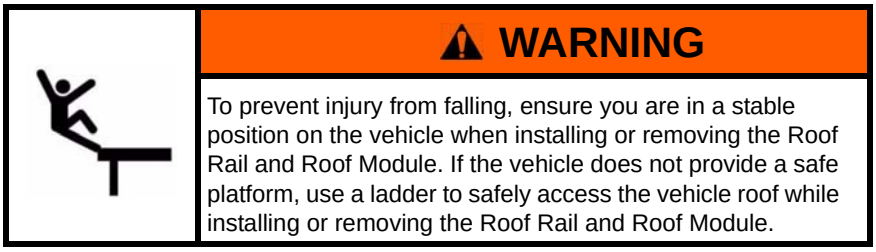
Roof Module Installation

This **Roof Module Installation** chapter contains information in the following sections:

- *Safety Notes*
- *Roof Rail Installation*

Safety Notes

- The AutoSteer system must be powered OFF when installing or removing the Roof Module.
- The Roof Module must always be firmly secured to the Roof Rail using the hardware whenever the vehicle is in operation to prevent the Roof Module from releasing from its bracket and falling.
- The Roof Module must be removed when transporting the vehicle at speeds above 30 mph.
- Ensure you are in a safe position on the vehicle platform when removing the Roof Module, so that you do not fall or drop the Roof Module
- Use a ladder to install the Roof Rail and Roof Module.


WARNING
To prevent injury from falling, ensure you are in a stable position on the vehicle when installing or removing the Roof Rail and Roof Module. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle roof while installing or removing the Roof Rail and Roof Module.

Roof Rail Installation

1. Remove the two rear cab roof bolts using a 24mm socket and ratchet, reuse the bolts to secure the Roof Rail. See *Figure 5-1*.

Note: Longer bolts and spacer washers are provided for installations where the Roof Rail needs to be raised above the roof.

Figure 5-1 Removing Bolts for Roof Rail Installation

2. Attach the Roof Rail using the previously removed bolts along with the extra M16 flat washer supplied in cab roof bolt kit. See *Figure 5-2*.

Figure 5-2 Attaching Roof Rail with Bolts

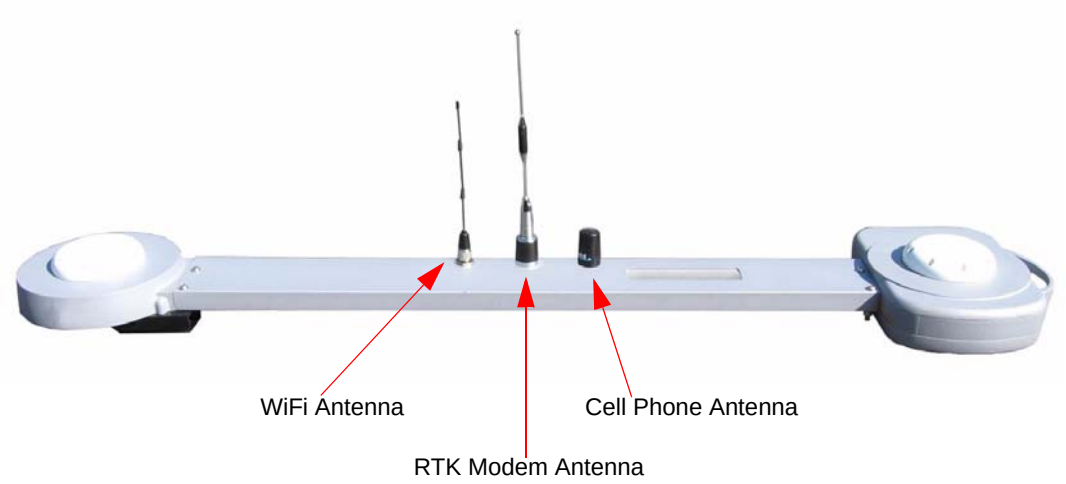
3. Tighten the bolts securely with a 24mm socket and ratchet.
4. *Figure 5-3* shows the Roof Rail installed.

Figure 5-3 Roof Rail Installed

5. Attach the three antennas to the proper Roof Module antenna connections. See *Figure 5-4*.

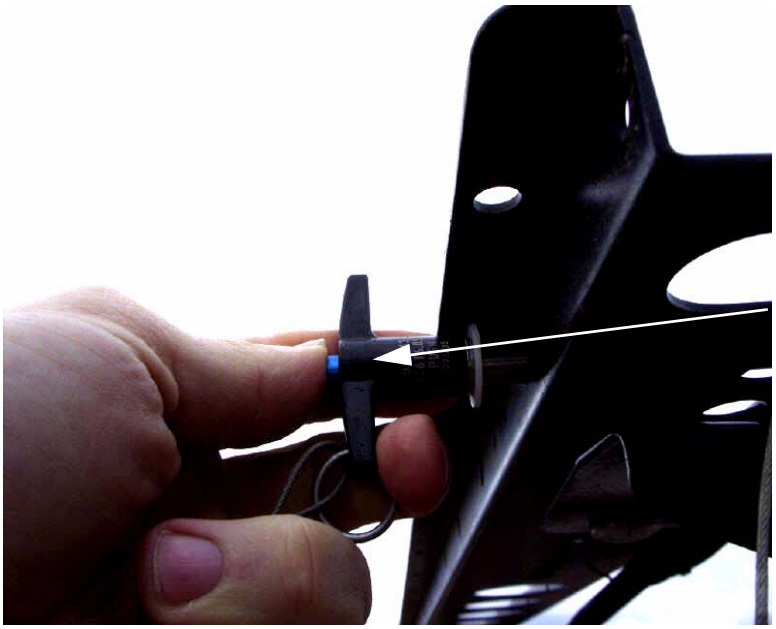
Note: Hand tighten the connections. Do not use tools or over tighten.

Figure 5-4 Antennas Attached to the Roof Module



6. Remove the Locking Pin from the Roof Rail. See *Figure 5-5*.

Figure 5-5 Removing the Locking Pin



7. Place the Roof Module on the Roof Rail. See *Figure 5-6*.

Figure 5-6 Mounting Roof Module on Roof Rail

8. Test the tightness of the Roof Module from side-to-side.
9. Reinsert the Locking Pin. See *Figure 5-7*.

Note: The Locking Pin can be inserted from either side of the Roof Rail.

Figure 5-7 Reinserting the Locking Pin

10. The Roof Module is now installed. See *Figure 5-8*.

Figure 5-8 Roof Module Installed

Display Installation

This **Display Installation** chapter contains following Display information:

- *Introduction*
- *Installation Procedure*

Introduction

This chapter provides the instructions for installing the RAM Mount Ball in the cab so the Display can be attached later. Refer to your Display user manual for instructions on installing the Display.

Note: The Display components may different depending on the model vehicle and the specific Display being installed.

Installation Procedure

1. Locate the holes on the right side cab post. See *Figure 6-1*.

Figure 6-1 Mounting Holes on Cab Post

2. Mount the Display Bracket to the cab frame.

Note: Use the longer bolts and spacer bushings supplied in the installation kit. Use the spacer bushing between the bracket and the cab post.

---

3. Tighten the two bracket bolts using a socket and ratchet. See *Figure 6-2*.

Figure 6-2 Display Mounting Bracket Installed

4. Mount the smaller bracket to the main bracket, using the nuts and bolts supplied. Tighten the bolts using a 14mm socket and ratchet. See *Figure 6-3*.

Figure 6-3 Attaching Smaller Bracket to Main Bracket

5. Attach the RAM Mount to the Display Mounting Bracket. See *Figure 6-4*.

Figure 6-4 Attaching RAM Mount to the Display Bracket

Note: Refer to the Display user manual for the remaining Display-specific installation instructions.

Connecting System Cables

This **Connecting System Cables** chapter provides information for connecting the Main Cable Harness and the SA Module Cable Harness to various vehicle and AutoSteer components in the following sections:

- *SA Module Harness*
  - *SA Module Connection*
  - *Wheel Angle Sensor Connection*
  - *Steering Valve Connection*
- *Main Cable Harness*
  - *Roof Module*
  - *Main Cable Harness Connections Inside Cab*
  - *SA Module Harness*
- *Power Supply Connection*
  - *Cab Power Connection*
  - *Battery Power Connection*

SA Module Harness

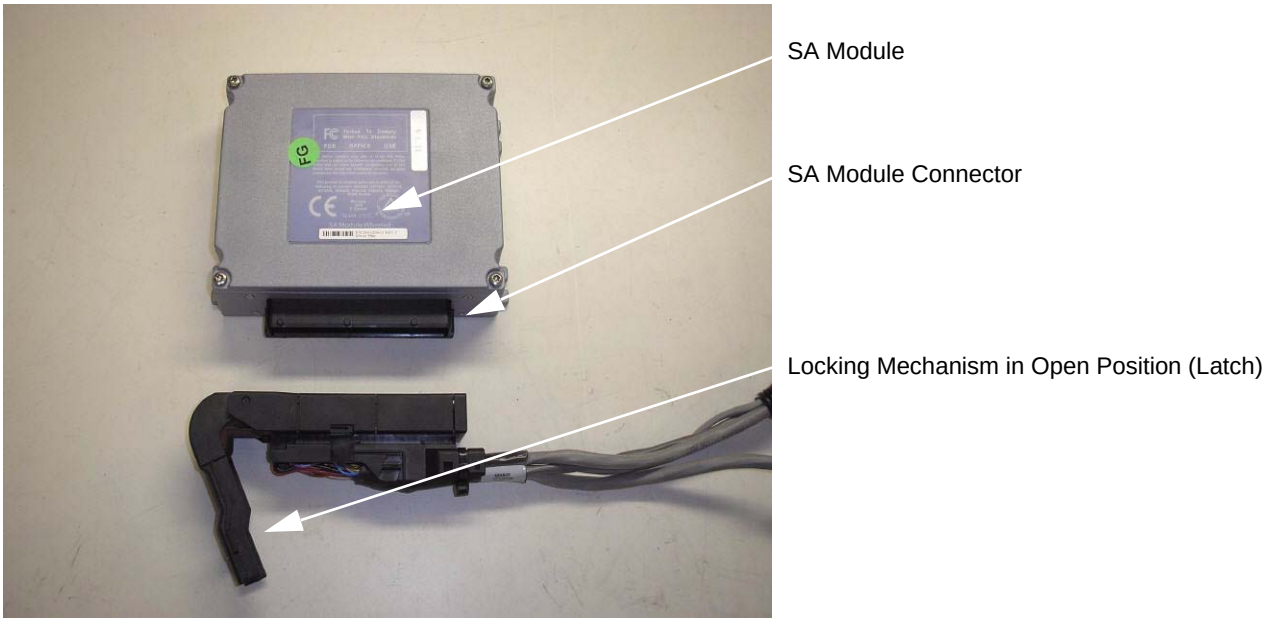
This **SA Module Harness** section contains the following sub-sections:

- *SA Module Connection*
- *Wheel Angle Sensor Connection*
- *Steering Valve Connection*

SA Module Connection

1. Push the SA Module Harness cable through the hole in the cab floor or cable feed through.
2. Align the SA Module Harness connector to the SA Module. See *Figure 7-1*.
3. Open the connector latch lever. See *Figure 7-1*.

Figure 7-1 Connecting SA Module Connector



4. Press the SA Module Harness connector onto the SA Module connector.

Note: You can damage the connectors if your force them into position. Do not force them together or use tools.

5. Press the latch lever closed until it clicks and locks the connector. See *Figure 7-2*.

Figure 7-2 Closing the SA Module Connector

Note: If you need to disconnect the SA Module connector, you must open the latch lever before attempting to pull the connectors apart.

6. Close the cable connector locking mechanism as shown in *Figure 7-3*.

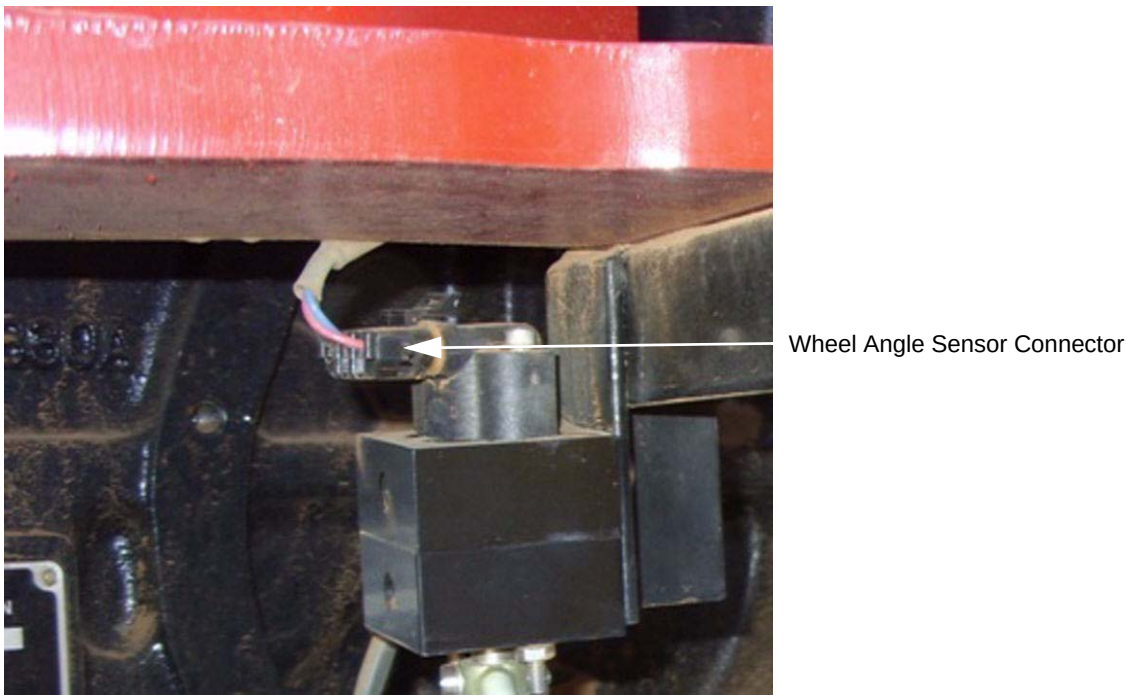
Figure 7-3 SA Module Connector (closed)

Wheel Angle Sensor Connection

Note: This connection to the Wheel Angle Sensor is only required when using the AutoSteer Wheel Angle Sensor.

1. Attach the WAS IN cable connector to the Wheel Angle Sensor. See *Figure 7-4*.

Figure 7-4 Wheel Angle Sensor Cable Connection

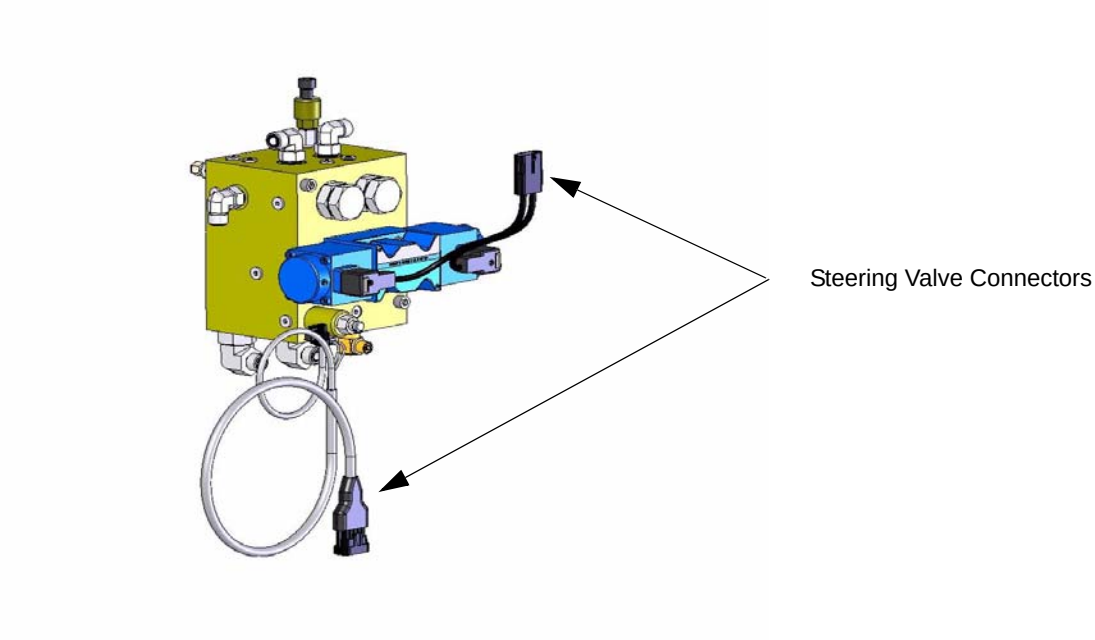


2. Secure all cables with cable ties.

Steering Valve Connection

1. Connect the Steering Valve's 4-pin and 10-pin connectors to the SA Module Harness. See *Figure 7-5*.

Figure 7-5 Steering Valve Connectors



2. Bundle any excess cable and secure with cable ties.

Main Cable Harness

This Main Cable Harness section contains the following sub-sections:

- *Roof Module*
- *Main Cable Harness Connections Inside Cab*
- *SA Module Harness*

Roof Module

1. Push the Main Cable Harness down through the cab floor hole. See *Figure 7-6*.

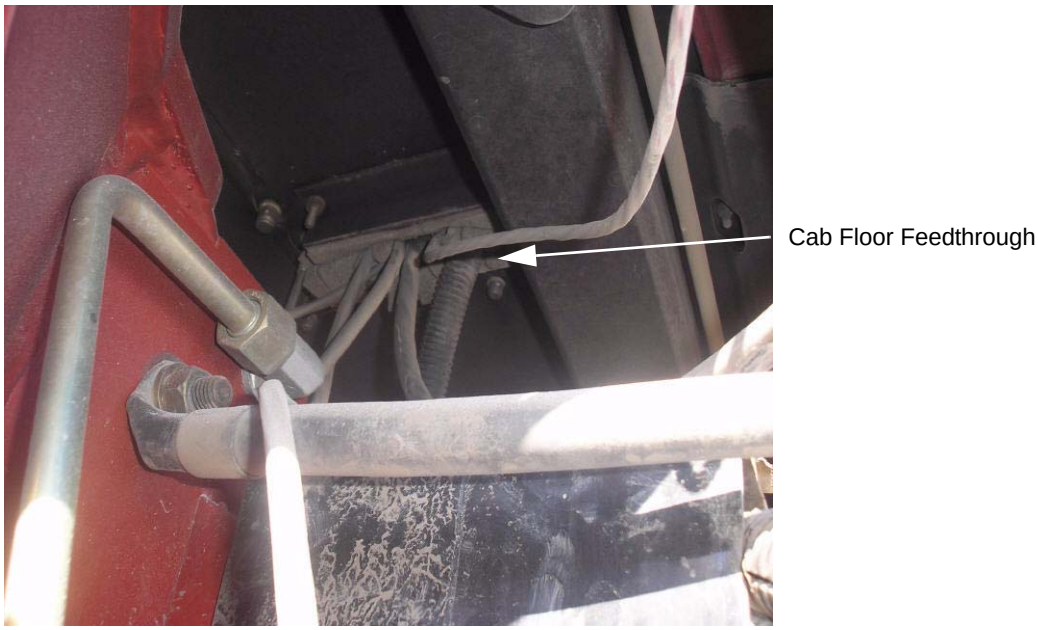
Figure 7-6 Passing Main Cable Harness Through the Floor Access Hole

2. Open the battery box door to access the underside of the cab entry point. See *Figure 7-7*,

Figure 7-7 Battery Box Door

3. Pull the cable through the hole in floor of cab. See *Figure 7-8*.

Figure 7-8 Routing Cable Though Cab Floor



4. Route the cable up the cab side. See *Figure 7-9*.

Figure 7-9 Route the Main Cable Harness up Cab Right Side

5. Secure the cable to the Roof Rail using cable ties.

6. Attach the cable to the Roof Module. See *Figure 7-10*.

Orient the 12-pin connector so the word “TOP” on the cable connector is pointing upwards (towards the sky). Insert the cable connector into the Roof Module. Push the connector in until it “clicks” and locks in place. To remove, grasp the connector to compress the two side latches and pull away from the Roof Module.

Note: Do not force the connector. If the connector does not engage easily, check for the correct orientation of the connector.

Figure 7-10 Roof Module Main Harness Connection

7. Attach the LAN connector to the Roof Module. See *Figure 7-11*.

Orient the Ethernet cable connector with the connector under the receiver so the contacts on the cable connector are pointing towards the back of the vehicle. (This will usually be towards your right side if you are standing on the left side of the vehicle and looking towards the Roof Module.) Slide the cable connector into the receiver and rotate the plastic bayonet sleeve clockwise to lock the connector. The bayonet sleeve will “click” when it fully engages and locks. To remove the cable, rotate the bayonet sleeve counterclockwise until it “clicks” and pull the connector down or away from the Roof Module.

Note: Do not force the connector. If the connector does not engage easily, check for the correct orientation of the connector.

Figure 7-11 Roof Module Ethernet Connection

Main Cable Harness Connections Inside Cab

Figure 7-12 shows the Main Cable Harness connections used inside the cab. *Table 7-1* shows the functions of the Main Cable Harness cab connectors. Refer to your Display user manual for instructions on connecting the Main Cable Harness connections shown to the correct ports and harnesses on the Display and Display cables.

Figure 7-12 Main Cable Harness Cab Connections

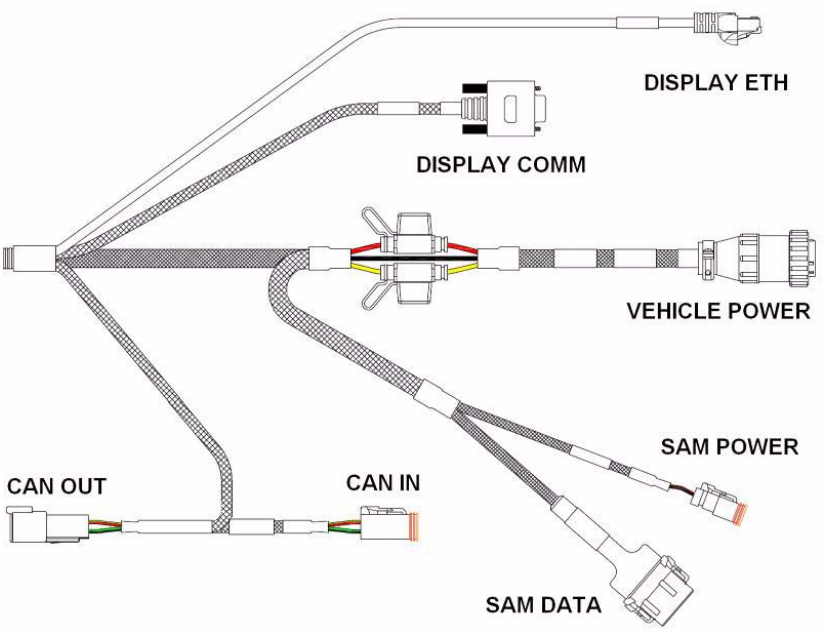


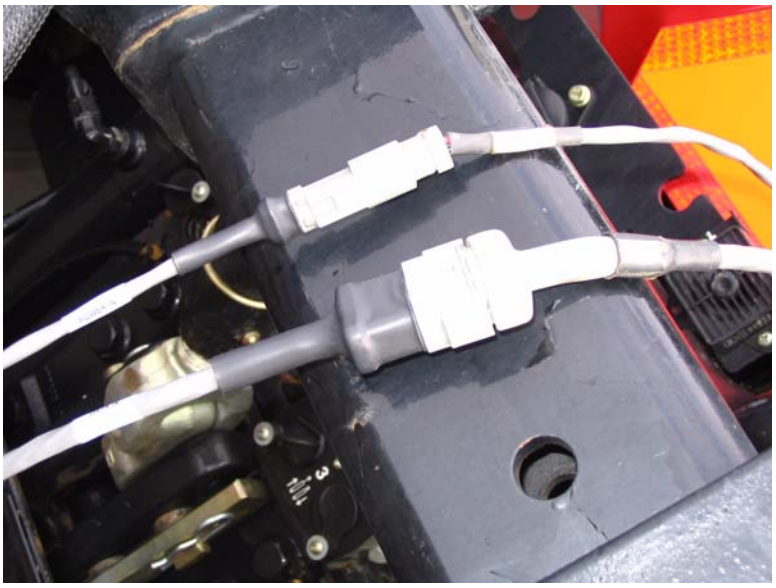
Table 7-1 Cab Main Cable Harness Connector Functions

Main Cable Harness Connector	Connector Function
DISPLAY ETH	Display Ethernet Port (RJ-45)
DISPLAY COMM	Display Communication Port (DB-9)
VEHICLE POWER	12 Volt Power
SAM POWER	Power for SA Module
SAM DATA	Data for SA Module
CAN IN	Not Used for This Installation
CAN OUT	Not Used for This Installation

SA Module Harness

1. Connect the SA Module Harness to the Main Cable Harness using the 4-pin connector and 12-pin connector. See *Figure 7-13*.

Figure 7-13 SA Module Harness and Main Cable Harness Connections



Power Supply Connection

The following sub-sections describe basic instructions for connecting the AutoSteer system to available vehicle power sources:

- *Cab Power Connection*
- *Battery Power Connection*

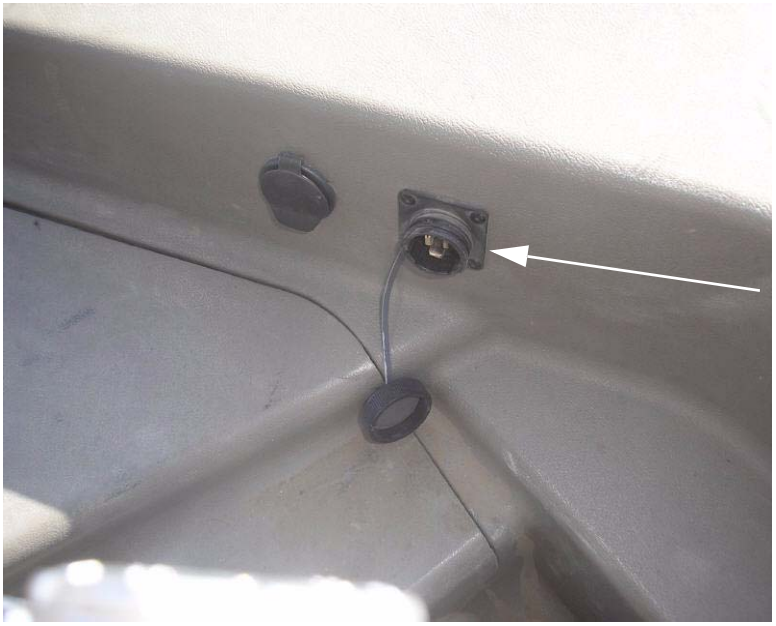
Note: Refer to your Display user manual before connecting the AutoSteer system to vehicle power.

The AutoSteer Main Cable Harness must be connected to a 3-pin 12V power source. Your Display user manual provides specific instructions for connecting power to the AutoSteer system and specifies the appropriate vehicle power source.

Cab Power Connection

1. Locate the cab console right-side 12V convenience power outlet. See *Figure 7-14*.
2. Use this 12V accessory power connector if the Display user manual specifies connecting to power inside the cab.

Figure 7-14 Convenience Power Outlet



Battery Power Connection

1. Locate the vehicle battery. See *Figure 7-15*.

Note: You must open the battery box door to access the vehicle battery. See *Figure 7-15*.

---

2. Connect to the vehicle battery if the Display user manual specifies a direct battery connection.

Figure 7-15 Vehicle Battery Location

Note: A battery cable is provided with the AutoSteer system when a direct battery connection is required.

Post-Installation Procedures and Information

The **Post-Installation Procedures and Information** chapter provides information in the following sections:

- *Hydraulic Leak Check*
- *Create New Vehicle*
- *Calibration and Tuning Guidelines*

Once the entire AutoSteer system, including the Display and Display harnesses, have been installed on the vehicle, the procedures and notes provided in this chapter must be followed to complete the installation and prepare the vehicle for full AutoSteer capabilities.

Hydraulic Leak Check

On completion of installing the entire AutoSteer system including the Roof Module and Display, the system needs to be checked for leaks. Follow the procedure below to check for leaks.

1. Clear any bystanders away from the vehicle. If there is a hydraulic leak, they could be injured.
2. Put the vehicle into Park and/or set the parking brake to prevent the vehicle from moving.
3. Turn the vehicle over for a few seconds and if the vehicle starts, immediately shut it down.
4. Walk around the vehicle and check all the hydraulic fittings that were opened. Look for any oil leaks.
5. Once all leaks have been repaired, or if none are found, start the vehicle again and let it run at a low idle.

Note: If an oil leak is noticed during any part of this test, immediately shut down the vehicle and repair the leak.

Note: The front wheels will move when the steering wheel is turned. Make sure the vehicle will not strike anything or anyone before continuing. If necessary, move the vehicle to an open area.

---

6. Take the vehicle out of Park and/or remove the parking brake. Turn the steering wheel manually to the right and left stops two or three times to get any air out of the hoses.
7. Confirm the front wheels turn in the correct direction and the vehicle steers the same as it did before the system was installed.
8. Put the vehicle back into Park and/or reset the parking brake. Shut down the vehicle, walk around it again, and check for any hydraulic leaks.

9. Once the leaks have been repaired, or if none are found, start the vehicle again and let it run at a low idle.
10. Take the vehicle out of Park and/or remove the parking brake. Move the vehicle to an open, flat area and leave the vehicle in Park.
11. Power up the Display and navigate to the **Hydraulic Valve** window from the **Steering Components** window.
12. Command the vehicle to turn Right and then Left a few times. The vehicle should steer in the direction it is commanded. If the vehicle rotates in the wrong direction, the hoses were attached to the wrong ports on the AutoSteer valve and need to be switched.
13. Power down the Display, put the vehicle back into Park and/or reset the parking brake, and shutdown the vehicle.
14. Once again check the vehicle for hydraulic leaks and repair any that are found.

Create New Vehicle

Note: Do not start the vehicle until after the Hydraulic Leak Test has been performed on the vehicle. After the vehicle has been created, shut down the AutoSteer system prior to starting the vehicle.

Once the entire system has been installed, the operator must first create a new vehicle profile. This configures the system so the User display can properly communicate with the various sensors and components on the vehicle. Follow the procedure below to create a new vehicle.

1. Make sure the User display is not powered ON.
2. Start the vehicle and take it to a clear area (such as an open field) where it can be calibrated.
3. Power up the AutoSteer system.
4. Follow the instructions provided in the Display user manual to create a new vehicle.

Calibration and Tuning Guidelines

Note: For optimal steering performance, the AutoSteer system must be fully calibrated and then tuned.

Final Hardware Installation Checklist

This **Final Checklist** chapter contains the verifications steps necessary after the installation of the AutoSteer system.

Note: The Final Hardware Installation Checklist is on the back of this page. Fill in the checklist after the installation. You should keep a copy of this checklist and this manual for future reference when servicing the AutoSteer system.

Machine Model: _____ Year: _____ Serial #: _____

Customer Name: _____

Location/Address: _____

AutoSteer Installation Kit Part Number: _____

NOTES

_____

_____

_____

_____

_____

_____

Name of Installer: _____ Date: _____

System Installation Checklist

1. Wheel Angle Sensor installed and all fasteners are tight. (optional) ☐
2. Display Bracket and Display are installed and all fasteners are tight. ☐
3. Roof Rail and Roof Module are installed and all fasteners are tight. ☐
4. SA Module is installed and all fasteners are tight. ☐
5. All cable ends are connected. ☐
6. All cables are secured with cable ties. ☐

Hydraulic Installation Checklist

1. Steering Valve is installed and all fasteners are tight. ☐
2. All hose fittings are tight. ☐
3. Check for oil leaks on all hydraulic connections. ☐
4. All hoses are routed and secured with cable ties. ☐
5. Manual steering is normal after the AutoSteer installation. ☐

AutoSteer Performance Checklist

1. Complete AutoSteer system calibration. ☐
2. Complete AutoSteer system tuning. ☐
3. Check total Wheel Angle Sensor counts. (optional) ☐ Value_____
4. Line acquisition is good. ☐
5. On-line steering is good. ☐
6. Manual override (kick-out) is working. ☐
7. Steering speed from lock-to-lock is satisfactory. ☐ Value_____Sec.

Note: See the *Post-Installation Procedures and Information* chapter for additional information.